DRAFT
ONONDAGA LAKE
2018 ANNUAL AND COMPREHENSIVE MONITORING AND MAINTENANCE REPORT

ONONDAGA COUNTY, NEW YORK

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LIST OF ACRONYMS

Acronym	Definition
AMP	Ambient Monitoring Program
AWQS	Ambient Water Quality Standards
BAP	Biological Assessment Profile
BSQV	bioaccumulation-based sediment quality value
cm	centimeter(s)
CPOI	chemical parameters of interest
DDT	Dichlorodiphenyltrichloroethane
DUSR	Data Usability Summary Report
GAC	granular activated carbon
$g/cm^2/yr$	gram(s) per square centimeter per year
g/cm^3	gram(s) per cubic centimeter
HCB	hexachlorobenzene
IRM	Interim Remedial Measure
ISUS	in-situ ultraviolet spectrophotometer
LOAEL	lowest-observed-adverse-effect level
Metro	Metropolitan Syracuse Wastewater Treatment Plant
µg/L	microgram(s) per liter
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
$mg/m^2/day$	milligram(s) per square meter per day
mL	milliliter
MPC	Modified Protective Cap
mph	mile(s) per hour
mm	millimeter
MNR	monitored natural recovery
MT	metric ton
NAVD88	North American Vertical Datum of 1988
ng/L	nanogram(s) per liter

LIST OF ACRONYMS (CONTINUED)

NOAA	National Oceanic and Atmospheric Administration
NYSDEC	New York State Department of Environmental Conservation
OCDWEP	Onondaga County Department of Water Environment Protection
OLMMP	Onondaga Lake Monitoring and Maintenance Plan
O&M	operations and monitoring
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyls
PEC	probable effects concentration
PECQ	PEC quotient
PDI	pre-design investigation
PRG	preliminary remediation goal
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
RA	Remedial Area
RAO	remedial action objective
ROD	Record of Decision
SMU	Sediment Management Unit
SOP	standard operating procedures
SRP	Soluble Reactive Phosphorus
SSC	sediment screening criteria
SU	Syracuse University
SUNA	submersible ultraviolet nitrate analyzer
SUNY ESF	State University of New York College of Environmental Science and Forestry
SVOC	semivolatile organic compound
SWQS	surface water quality standards
TDS	total dissolved solids
TEQ	toxic equivalent
TLC	thin layer cap

LIST OF ACRONYMS (CONTINUED)

TOC	total organic carbon
TOGS	Technical and Operations Guidance Series
UCL	upper confidence limit
UFI	Upstate Freshwater Institute
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WB 1-8	Wastebeds 1-8
WB-B/HB	Wastebed B/Harbor Brook

EXECUTIVE SUMMARY

Honeywell continues progress toward achieving the goals of the Onondaga Lake Record of Decision (ROD) and the community's vision for a restored Onondaga Lake with the implementation of the long-term lake monitoring program. The remediation plan was selected by the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (USEPA). Under NYSDEC oversight, the Honeywell team developed and implemented a remedy design that was approved by both agencies and continues to demonstrate its effectiveness in meeting the objectives outlined in the ROD. The remedy included a combination of dredging, capping, and habitat restoration – standard environmental cleanup methods that addressed the contamination in lake sediments and water. Lake dredging was completed in November 2014. Approximately 2.2 million cubic yards of material were removed from the bottom of the lake. Capping was completed in December 2016. More than 3 million cubic yards of material consisting primarily of sand, activated carbon, and gravel were used to cap 475 acres of the lake bottom. The cap also provided a new habitat layer. Habitat restoration, including shoreline wetland restoration and extensive planting of aquatic native species, was completed in late fall 2017.

The Honeywell design team consisted of more than 100 local engineers and scientists working with nationally recognized experts from various universities, research institutions, and specialty engineering firms, NYSDEC, and USEPA. Community stakeholders also provided input. Similarly, the Honeywell team developed the lake monitoring program with input from many of the same team members, including Parsons, Anchor QEA, Upstate Freshwater Institute (UFI), the State University of New York College of Environmental Science and Forestry (SUNY ESF), NYSDEC, and USEPA.

The Onondaga Lake Monitoring and Maintenance Plan (OLMMP) (Parsons 2018b) presents the criteria, monitoring program, and decision-making framework for measuring progress toward, and attainment of, the remedial goals set forth in the ROD (NYSDEC and USEPA 2005). The monitoring program enables the team to track progress and ultimately verify remedy effectiveness in achieving the preliminary remedial goals (PRGs) and, thereby, the remedial action objectives (RAOs) specified in the ROD.

This report presents the comprehensive results from the 2018 lake monitoring program. As per the OLMMP, this report is also the first comprehensive lake monitoring report summarizing the preceding five years of monitoring and evaluating trends over time. The comprehensive reports will be provided to NYSDEC every five years in addition to the annual monitoring and maintenance reports and will be made available to the public. This report contains discussions related to activities that occurred before 2018.

Overall, results indicate that the remedy is protective of human health and the environment, and monitoring should continue in 2019 as specified in the OLMMP. The monitoring and maintenance program includes seven separate, but related, elements. Each of these programs, along with results and recommendations are summarized below.

SMU 8 Monitored Natural Recovery (MNR). Based on an evaluation of the comprehensive data set, natural recovery of Sediment Management Unit 8 (SMU 8) sediments is progressing faster than anticipated based on projections completed as part of the Final Design. The primary natural recovery mechanism in SMU 8 (deep water portions of the lake) is burial of sediment by incoming cleaner sediments that are continually being deposited from overlying water. MNR was projected in the Final Design to achieve the ROD-specified sediment remedial goals for the uncapped portions of SMU 8 within 10 years following the remediation of upland sources, littoral sediments, and initial thin-layer capping in SMU 8 (i.e. by 2026). Monitoring conducted over the last five years includes the following:

- Analysis of surface sediments for total mercury
- Sediment trap sampling and analysis for mercury and suspended solids analysis
- Collection and assessment of sediment cores from microbead plots to assess sedimentation rates and mixing depth
- Collection and identification of benthic macroinvertebrates

Data indicate that MNR sediment-based goals have already been achieved. Therefore, it is recommended that the 2020 sediment monitoring event be completed for compliance verification. This entails sampling from a higher number of sampling locations than was completed during prior sampling events, as detailed in the Monitored Natural Recovery Work Plan in the OLMMP. The 2020 sampling would be the first year of two compliance sampling events. If the 2020 sampling indicates SMU 8 sediments have achieved remedial goals, a second compliance sampling event would occur in 2021 consistent with the compliance sampling protocol in these areas. Additionally, annual sediment trap monitoring should continue as described in the OLMMP.

Biota (Fish) Tissue. Mercury concentrations in all sport fish species have generally declined since monitoring began in 2008. Concentrations have continued to decline since completion of dredging and capping. Mean mercury concentrations in 2018 were below Human Health Performance Criteria for Carp and Pumpkinseed but were above the criteria for Smallmouth Bass and Walleye. Mean mercury concentrations in 2018 in large prey fish, represented by White Sucker, were below the Ecological Performance Criterion on a lake-wide basis. Likewise, small prey fish mean mercury concentrations in each SMU and on a lake-wide basis were below the Ecological Performance Criterion in 2018.

Performance criteria for mercury concentrations in fish tissue were developed in the ROD and consider both human health and ecological exposures. Concentrations of organic compounds are considered as points of reference (i.e., targets) for future evaluations of risk reduction for human and wildlife consumers of fish. These compounds include polychlorinated biphenyls (PCBs) in sport fish and prey fish, dioxins/furans in sport fish, and dichlorodiphenyltrichloroethane (DDT) and metabolites in prey fish. Annual sampling includes both adult sport fish (for human health exposure) and prey fish (for ecological exposure). The ROD estimated that concentrations of contaminants in fish will be reduced within 10 years following completion of remedial activities (i.e., by 2026).

The OLMMP specifies that annual comprehensive fish monitoring will be completed through at least 2019, therefore it is recommended that biota sampling continue in 2019 and until remedial goals are met as specified in the OLMMP.

Surface Water. The performance criteria for surface water are the NYSDEC surface water quality standards and Division of Water technical and operational guidance series ambient water quality standards and guidance values. Surface water sampling and analysis was conducted in 2017 and 2018 at numerous locations to assess compliance with these goals. Surface water criteria for mercury, VOCs and SVOCs have been achieved for two consecutive years. Therefore, consistent with the OLMMP, termination of monitoring for these parameters is recommended. Total PCB concentrations exceeded the specified goals. However, PCB goals are very low based on consideration of potential bioaccumulation within fish and other biota, and levels in the Great Lakes region rainwater have also been measured at concentrations exceeding these goals. Therefore, the achievement of the surface water goals for PCBs is likely not practicable. It is recommended that additional monitoring for PCBs be conducted in 2020, including monitoring of tributaries to facilitate evaluation of their impacts on PCB concentrations in Onondaga Lake. The proposed scope of this monitoring will be submitted under separate cover to NYSDEC for review and approval in advance of the 2020 field season.

Cap Maintenance and Monitoring. The 2017 and 2018 cap monitoring results verify that the cap remains protective of human health and the environment. The sediment cap is designed to provide long-term chemical isolation of contaminants and maintain physical stability while providing a suitable habitat substrate. Performance criteria for the cap within Onondaga Lake were developed in the OLMMP based on the RAOs presented in the ROD. Long-term monitoring includes both physical and chemical monitoring.

Physical monitoring is conducted to verify that the cap is stable and remains in place. Results from the 2017 and 2018 comprehensive cap physical monitoring events verified that the cap remains physically stable, and there has been no significant loss of cap material in any of the capped areas. It is recommended that comprehensive physical monitoring of the cap be completed in 2019 consistent with the OLMMP.

Chemical monitoring is conducted to verify that the cap is providing chemical isolation. During 2017 and 2018 combined, more than 7,200 chemical analyses were completed on samples collected from over 150 sampling locations. The low percentage of detected contaminant concentrations in cap samples are attributable to migration of background-level concentrations such as from tributaries, and/or migration from adjacent areas during cap construction. Based on these monitoring results, it is recommended that the focused chemical monitoring event scheduled in the OLMMP for 2019 be expanded to be a comprehensive chemical monitoring event to provide a more robust long-term data set to verify ongoing chemical isolation.

Habitat Reestablishment and Biological Response. Vegetation and wildlife monitoring conducted in 2017 and 2018s show that newly restored habitats are providing a diverse, functional habitat for a variety of species. Restoring diverse, functioning and sustainable habitats to the remediated areas of Onondaga Lake was one of the top priorities of the remedial program. Therefore, habitat considerations are a significant component in the long-term monitoring and maintenance plan for the lake.

Monitoring of wetland and adjacent upland planted vegetation in 2017 and 2018 verified that all interim goals were met. Minor maintenance activities in the form of additional plantings were completed in 2018, and additional minor plantings are recommended for 2019 to ensure continued progress toward meeting long-term vegetation goals specified in the OLMMP.

Habitat monitoring verified the restored areas are attracting robust and diverse wildlife usage. Overall, approximately 90 wildlife species were observed across all remediation areas in 2018. As expected, most were found within the restored wetlands. This included 60 species of birds, 12 macroinvertebrates, six mammals, and three amphibians. Common wildlife species included Great Blue Heron, Spotted Sandpiper, and Killdeer. Other notable species include northern leopard frog, American toad, green frog, Pied-billed Grebe, and Bald Eagle.

Over 20 years of research by SUNY ESF has shown that Onondaga Lake is home to a robust and diverse fish community. Data collected in 2017 and 2018 show that this continues to be the case both within and outside of remediation areas. As detailed in the OLMMP, although there are no goals for the fish community, monitoring is conducted to document how fish are using the newly restored habitats in the lake. A total of 42 fish species were documented in Onondaga Lake in 2018.

Wastebeds 1-8 Shoreline Stabilization Turbidity Monitoring. Monitoring completed in 2017 verified that shoreline stabilization measures implemented along the Wastebed 1-8 (southwestern) shoreline were successful in stabilizing calcite deposits and in reducing sediment resuspension and turbidity along this shoreline. Shoreline stabilization consisted of placing a layer of gravel in submerged and adjacent upland areas of the shoreline and seeding the upland areas with native vegetation. The goals for the Wastebed 1-8 shoreline stabilization were to reduce near-shore turbidity associated with wind/wave events and to reduce shoreline erosion. The 2017 monitoring included deployment of three turbidity meters adjacent to the shoreline of Wastebeds 1-8 to collect turbidity measurements every 15 minutes for three months. Monitoring results verified a reduction in wind-driven turbidity along the Wastebeds 1-8 shoreline after stabilization was implemented. Therefore, consistent with the OLMMP and as documented in the 2017 Annual Report, no further routine turbidity monitoring was warranted in 2018. Annual physical inspections of this area will be conducted as part of the long-term cap physical monitoring program, as detailed in OLMMP. Additional turbidity monitoring, if required based on the annual visual inspections, would be developed in consultation with NYSDEC and subject to the agency's approval.

Institutional Controls. Institutional controls are actions such as administrative and legal controls that are implemented to help minimize the potential for human health or ecological exposure to sediment contamination and ensure the long-term integrity of the remedy. Institutional controls being implemented at Onondaga Lake include:

- Fish consumption advisories and related public communication activities
- Recreational boating buoys, updated navigational charts and related public communication activities to prevent recreational boaters from accidently hitting potential navigational hazards created by capping and restoration components of the remedy
- Regulatory permitting controls to prevent damage to the cap from activities such as navigational dredging

Specific institutional controls as specified in the OLMMP remain in place and effective.

Nitrate Addition. Full-scale addition of nitrate in Onondaga Lake during 2018 and prior years successfully met objectives and resulted in methylmercury concentrations in lake water remaining near background levels. Methylmercury can be released from Onondaga Lake bottom sediment in the lake's profundal zone (called SMU 8) if lower waters are depleted of oxygen and nitrate during summer stratification. If methylmercury is released to the water column, it eventually enters the food web where it can bioaccumulate in lake organisms. Addition of nitrate to the lower waters limits methylmercury release and thereby limits mercury bioaccumulation in aquatic life within Onondaga Lake. This is the eighth year in which methylmercury was effectively controlled during summer lake stratification through addition of a diluted calcium nitrate solution. Full-scale addition will continue to be implemented as needed (Parsons and UFI 2014b).

SECTION 1

INTRODUCTION

1.1 OVERVIEW

This annual report presents the comprehensive results of the Onondaga Lake remediation monitoring and maintenance conducted by Honeywell in 2018. The OLMMP (Parsons 2018b) presents the criteria, monitoring program, and decision-making framework for measuring progress toward, and attainment of, the remedial goals set forth in the ROD (NYSDEC and USEPA 2005). The ROD remediation plan, which was selected by the NYSDEC and USEPA, included a combination of dredging and capping – standard environmental cleanup methods that addressed the contamination in lake sediments and water. Lake dredging was completed in November 2014, a year ahead of schedule. About 2.2 million cubic yards of material were removed from the bottom of the lake. Capping was completed in December 2016. More than 3 million cubic yards of material consisting primarily of sand, activated carbon, and gravel were used to cap 475 acres of the lake bottom, providing a new habitat layer. Habitat restoration was completed in late fall 2017 and included shoreline wetland restoration and extensive planting of aquatic vegetation.

As detailed in the OLMMP, the lake monitoring program includes the following seven separate, but related, elements:

- SMU 8 MNR
- Biota Tissue
- Surface Water
- Cap Maintenance and Monitoring
- Habitat Reestablishment and Biological Response
- WB 1-8 Shoreline Stabilization Turbidity Monitoring
- Institutional Controls

Monitoring associated with the above activities began in 2017 under the Draft OLMMP, with approval by the NYSDEC. This report presents the comprehensive results from the 2018 monitoring program. Overall, results indicate that the remedy is protective, and monitoring should continue in 2019 as per the OLMMP. Recommendations for any changes are set forth in the individual sections below.

1.2 DOCUMENT ORGANIZATION

As per the OLMMP, annual reporting for the various monitoring components generally consists of presenting monitoring data and confirming that data are consistent with expectations. Recommendations are made for future monitoring for each respective component. In addition to the executive summary and this introduction, the report is organized into the following sections:

- Section 2 presents results of monitoring of habitat and biological response.
- Section 3 presents results of biota tissue monitoring activities.
- Section 4 presents results of surface water monitoring as it relates to criteria attainment.
- Section 5 presents results of the monitored natural recovery monitoring.
- Section 6 presents results cap monitoring activities and the status of institutional controls.
- Section 7 presents results of the WB 1-8 turbidity monitoring conducted in 2017.
- Section 8 presents the results of Nitrate Addition and associated monitoring from 2018.

Appendices associated with each section provide additional information such as detailed field data, associated data usability summary reports, and other information relevant to the various monitoring elements.

This monitoring report is also the first comprehensive monitoring report, which summarizes the last five years of data and evaluates trends over time, as applicable. These analyses have been conducted and are included in this report in support of the upcoming USEPA Five-Year review.

SECTION 2

HABITAT REESTABLISHMENT AND BIOLOGICAL RESPONSE

2.1 INTRODUCTION

Habitat-related monitoring was conducted in 2017 and 2018 to document habitat reestablishment and biological response both within remediated areas and in lake-wide reference areas following completion of remediation and habitat restoration activities. Both vegetation and wildlife were monitored. Results show that newly restored habitats are providing a diverse, functional habitat for a variety of species.

Vegetation monitoring included both qualitative and quantitative surveys to evaluate vegetative aerial percent cover, relative percent cover of each species, aerial percent cover of invasive species, and cover type. Wildlife usage was evaluated throughout 2017 and 2018 during routine site visits and additionally during critical time periods, such as migration and reproduction windows. Lake-wide aquatic macrophyte (plant) and fish community surveys were also conducted in 2017 and 2018. Aquatic macrophyte surveys consisted of both qualitative and quantitative surveys to evaluate species composition and density in both remediated and unremediated areas of the lake. Gill, trap, and seine nets were used to conduct monthly fish community surveys from May through October, during which fish species composition, abundance, and species richness were evaluated. Benthic macroinvertebrate surveys were also conducted for the first time post-remedy to document recolonization of the new substrate placed as part of the remedy. With one minor exception detailed below, all habitat and biological monitoring activities carried out in 2018 were conducted in accordance with the OLMMP (Parsons 2018b). Monitoring results from 2017 and 2018 are presented in the following sections, with a focus on the 2018 results. Additional details regarding the 2017 monitoring are provided in the Draft Onondaga Lake Monitoring and Maintenance Report for 2017.

2.2 PLANTED VEGETATION

The Mouth of Ninemile Creek and the Wastebed B/Harbor Brook (WB-B/HB) Outboard Area are both monitored planted areas. As specified in the OLMMP, following five years of monitoring the vegetation coverage will be compared to the following success criteria for the wetland areas: 85 percent or greater cover with 5 percent or less of invasive species. Interim goals for each year for the respective areas are discussed below.

The Mouth of Ninemile Creek was planted in 2016 following the completion of construction activities, and 2018 represented the second year of the five-year monitoring program in that area. The following are interim goals per the OLMMP for the second year following planting in the Mouth of Ninemile Creek:

- At least 75 percent cover of wetland plants

- Management of invasive wetland plant species so that the percentage of invasive cover is zero percent[1]

The WB-B/HB Outboard area was planted in 2017 following the completion of construction, and 2018 was the first year of the five-year monitoring program for that area. The following are interim goals for the first year following planting in Outboard/Harbor Brook:

- Increased percent cover of wetland plants from the initial plantings
- Management of invasive wetland plant species so that the percentage of invasive cover is zero percent[1]
- 90 percent of large trees should be present

Vegetation was monitored in both areas using both qualitative and quantitative evaluation methods as described in the OLMMP. Periodic site visits were made throughout the growing season to document vegetation abundance and diversity and wildlife use of the site and to identify any potential issues before they become significant. Two qualitative reconnaissance surveys were conducted at each site, during which a comprehensive list of plant species present was documented. At the Mouth of Ninemile Creek, 134 plant species were observed during surveys conducted on June 19 and August 23, 2018. A total of 159 plant species were observed during surveys conducted the at Outboard/Harbor Brook area on June 15 and September 27, 2018.

Consistent with Appendix E of the Final OLMMP, quantitative vegetation monitoring was conducted at 59 plot locations at the Mouth of Ninemile Creek (Appendices 2A and 2B). Plot surveys were conducted in late August. Each 50-square-foot plot was assessed for cover type, total aerial cover, and relative cover for each species. These data show that the average vegetation coverage was 85 percent. Native sago pondweed (*Stuckenia pectinata*), common waterweed (*Elodea canadensis*), and coontail (*Ceratophyllum demersum*) were the most common species. Vegetation cover types across the site were estimated from these data and included extensive areas of emergent wetland and aquatic bed (Figure 2.1). Plot data are summarized in Table 2.1, and a photographic log of the area is provided in Appendix 2A. Invasive species cover across the area was 0.2 percent during the August survey. Annual treatment for invasive species is ongoing and was conducted during July and October 2018. The overall cover of vegetation at the mouth of Ninemile Creek has increased from 50 percent in 2017 to 85 percent in 2018, while the invasive species cover has remained under 1 percent (Figure 2.2). The overall site cover is expected to continue increasing, and invasive species are expected to remain low.

Similarly, quantitative vegetation monitoring was conducted at 64 plot locations at the Outboard/Harbor Brook site (Appendices 2A and 2B). Plot surveys were conducted in early September, with the same parameters being assessed in each 50-square-foot plot as were assessed

[1] The interim goal for zero percent invasive species aims to manage all invasive species on the site regardless of the percentage at which they are found. This will provide the maximum chance of successfully achieving the five percent or less goal after five years.

for the Mouth of Ninemile Creek. The average vegetation coverage in Outboard/Harbor Brook was 78 percent. Broadleaf cattail (*Typha latifolia*), common waterweed (*Elodea canadensis*), and cockspur grass (*Echinochloa spp.*) were the most common species. Shallow water areas had almost complete coverage of emergent wetland species, while the deeper areas tended to contain moderate growth of mostly floating aquatic and submerged plant species (Figure 2.3 and 2.4). Plot data are summarized in Table 2.2, and a photographic log of the area is provided in Appendix 2A. Invasive species cover across the area was 0.7 percent during the August survey. As in the Mouth of Ninemile Creek, annual treatment for invasive species is ongoing and was conducted in July and October 2018. Additionally, large tree conditions were surveyed in Outboard/Harbor Brook in August 2018 (Appendix 2B). Out of 103 large trees planted, 101 survived and were generally in good condition. One of the two trees that did not survive was replaced in November 2018. The second tree that did not survive will be replaced in Spring 2019. The survey is summarized and data are provided in Appendix 2B.

2.3 AQUATIC MACROPHYTES

Monitoring of aquatic macrophytes was conducted in 2017 and 2018 to document the natural recolonization by aquatic plants in remediation areas and the coverage in non-remediated areas (reference areas). As detailed below, significant natural recolonization of capped areas has already occurred. There are no specific success criteria for aquatic vegetation that naturally recolonizes shallow remediated non-planted areas.

2.3.1 Qualitative Survey

In June and August 2018, qualitative visual surveys of aquatic macrophyte coverage were conducted from a boat along the entire shoreline of Onondaga Lake, including remediated and non-remediated areas. Surveys were completed in accordance with the standard operating procedures (SOPs) found in the Quality Assurance Project Plan (QAPP) (Parsons 2018d). The spatial coverage of each plant type was estimated, and plants were identified to as high a taxonomic resolution as possible in the field. Vegetation coverage was assigned one of four categories: absent (zero percent cover), sparse (1-25 percent), moderate (26-75 percent), and dense (76-100 percent).

Lake-wide, eleven species were observed during the qualitative surveys. The most common species during the June monitoring event were Sago pondweed (*Stuckenia pectinata*), watermilfoil, (*Myriophyllum* spp.), and coontail (*Ceratophyllum demersum)*. The most common species during the August monitoring event were curly pondweed (*Potamageton crispus*), Sago pondweed, and watermilfoil. Species such as common waterweed (*Elodea canadensis*) and water stargrass (*Heteranthera dubia*) were also observed. Although the size, distribution, and density of beds were variable, most of the lake, including remediation areas, was characterized by moderate to dense macrophyte coverage. Data from the June event are summarized in Figures included in Appendix 2C.

2.3.2 Quantitative Survey

A quantitative survey was performed during August in both remediated and non-remediated areas of the lake in accordance with the SOP. Survey data can be found in Appendix 2C. Throw rake samples were collected from a boat at predetermined coordinate locations. A value between 0 and 3 was assigned for each throw rake, reflecting the categories used for the qualitative survey. Density was determined to be absent (category 0) through dense (category 3). Density was assigned for each taxon identified on the throw rake.

Lake-wide, twelve species were observed during the quantitative survey. The three most common species were stonewort (*Nitellopsis sp.*), watermilfoil, and coontail (Appendix 2D). Compared to the qualitative survey, the quantitative survey documented a somewhat lower plant density overall, consistent with 2017 results. Overall, more of the quantitative sampling locations contained vegetation than in 2017, particularly in remediation areas. The continued colonization and growth of vegetation in remediated areas (Figure 2.6) is encouraging and is expected to continue.

2.4 SHORELINE SURVEY

In 2018, a one-time survey was conducted by boat and on foot to characterize the vegetative community types around the entire margin of Onondaga Lake as called for in Appendix E of the OLMMP (Parsons 2018b). Three zones were surveyed for habitat type. These zones were shoreline (the interface of water and land), onshore (above the shoreline), and offshore (aquatic). As the margins of the lake were traversed, the dominant species, habitat features (such as woody debris), cover types, invasive species, and wildlife were recorded within each area. All survey data can be found in Appendix 2D.

Overall, the offshore component of the lakeshore is characterized by aquatic vegetation around the entire lake. This is consistent with the findings of the macrophyte surveys conducted in recent years. Around the north end of the lake, the riparian zone was mainly forested; on the east shoreline the upland area is a park/recreation area, while the upland area of the western shoreline is also forested. In the southern end of the lake, the western shoreline riparian zone, with the exception of the Willis wall/crane pad area, is a mix of the stabilized shoreline and emergent wetlands, transitioning into a sandy shoreline in the CSX area of the lake. The riparian zone of the eastern shoreline is mainly rip rap, with either forested areas, scrub shrub plant communities, or a roadways in the upland area. This survey serves as documentation of the various habitat types around the lake, in the event that future surveys are needed. Currently, and in accordance with the OLMMP, it is not anticipated that future shoreline surveys will be conducted.

2.5 FISH COMMUNITY

Over 20 years of research by SUNY ESF has shown that Onondaga Lake is home to a robust and diverse fish community. Data collected in 2018 show that this continues to be the case both within and outside of remediation areas. As detailed in the OLMMP, although there are no goals for the fish community, monitoring is conducted to document how fish are using the newly restored habitats in the lake. Monthly assessments were conducted in 2018 from May through October at 12 locations around Onondaga Lake (Figure 2.7) (Parsons 2018b). Fish were collected using gill nets, trap nets, and seine nets. The species were identified and recorded before the fish were released. Additionally, the lengths of the first 30 individuals of each species were measured. The abundance of additional individuals were also recorded. Fish data are summarized in Appendix 2E.

Lake-wide species richness in 2018 was 42 species, which is comparable to the lake-wide average richness of 40 species observed during the baseline sampling period (2008 through 2011, the 38 species observed during the construction period (2012 through 2016), and also to the 41 species observed in 2017. The species richness in both remediated areas (36) and unremediated areas (38) were comparable to average richness within these areas during the baseline and construction periods. Richness within remediated areas was higher than what was observed in sampling during the construction sampling period.

Year-to-year fluctuations in the relative abundance of fish are expected due to natural variability in such factors as year-class strength and catchability. Overall, however, the lake continues to contain a predominantly warm water fish community with abundance proportions similar to that of the baseline sampling period prior to dredging and construction. Some notable species of this community and their relative abundance in 2018 are largemouth bass (*Micropterus salmoides*) (14.26 percent), gizzard shad (*Dorosoma cepedianum*) (27.04 percent), banded killifish (*Fundulus diaphanous*) (36.56 percent), and bluegill (*Lepomis macrochirus*) (7.87 percent). The overall relative abundance data for fish species in the lake can be found in Appendix 2E.

2.5.1 Northern Pike Monitoring

The construction of the WBB/HB Outboard wetlands was completed in 2017. In 2018, monitoring for fish spawning was conducted in the WBB/HB Outboard wetlands in accordance with Section 7 and Appendix E of the OLMMP (Parsons 2018b). These events focused on monitoring for evidence of spawning/reproduction of Northern Pike (*Esox lucius*) and/or other wetland spawning species. Early season monitoring efforts were carried out from April 3rd to May 8th during the Northern Pike spawning season to assess whether the area was being used by spawning adults. Further monitoring efforts occurred from July 16th to August 9th during the months when the young of the year would likely be present and catchable in the wetlands.

The timing of the spawning season monitoring was determined by surface water temperature in the wetland. Northern Pike generally spawn in temperatures from 40-52°F (Smith 1985), so monitoring was conducted while the surface water temperatures in the wetlands were within this range. Trap nets and visual surveys were used during the spawning period in an attempt to document use of the wetlands. Twelve trap nets were set for 24-hour periods in the WB-B/HB Outboard wetlands. The July through August monitoring was focused on capturing the young of the year. Monitoring was conducted by placing nine 24-hour minnow traps, completing one backpack electroshocking event, using dip nets, and making visual observations (e.g., looking for schools of juveniles, scouting for areas to target netting/shocking) while walking the shoreline/berms. Seine nets were not used for this monitoring to minimize disturbance of establishing vegetation that was installed in 2017 or uprooting the new maintenance plantings that were installed in 2018. The monitoring locations can be found in Figure 2.8.

No adult or juvenile Northern Pike were observed during the monitoring period. However, fifteen species were observed during the April through May monitoring event, including Banded Killifish, Bluegill, and Brown Bullhead (*Ameiurus nebulosus*), as shown in Appendix 2E, indicating that the newly established habitat is being used by fish. Eleven species were observed during the July through August monitoring event, including young of the year Largemouth Bass and Brown Bullhead. Potentially spawning Longnose Gar (*Lepisosteus osseus*) were also observed. Since this was the first year of monitoring following the completion of construction and associated plantings and because Norther Pike are uncommon in Onondaga Lake, it was not unexpected that adult or juvenile Northern Pike were not observed. It is expected that, as vegetation expands, wetland spawning species will increasingly find and use these areas. Therefore, it is recommended that monitoring of this area continue in 2019 as described in the final OLMMP (Parsons 2018b).

2.6 WILDLIFE

The newly restored areas are providing high quality habitat for a diverse community of wildlife species. Although there are no specific success criteria for wildlife usage in remediated areas, monitoring is conducted to document functional wildlife use of the sites. Wildlife observations in 2017 and 2018 were recorded during routine site visits throughout the year and during the two qualitative surveys described for vegetation, as indicated in the SOP (Parsons 2018d). Additional observations were made during several focused monitoring events conducted during key times of the year (e.g., spring and fall migrations for waterfowl, spring for amphibians). Because amphibians can be challenging to observe directly, call surveys were conducted during the breeding period. Observations were recorded on approximately 56 days throughout 2018.

The restored areas are attracting diverse wildlife including large numbers of migrating waterfowl during spring and fall. Overall, approximately 90 species were observed across all remediation areas in 2018. As expected, most were found within the restored wetlands. This included 60 species of birds, nine fish species, 12 macroinvertebrates, six mammals, and three amphibians. Common wildlife species included Great Blue Heron (*Ardea herodias*), Spotted Sandpiper (*Actitis macularius*), and Killdeer (*Charadrius vociferus*). Other notable species include northern leopard frog (*Lithobates pipiens*), American toad (*Bufo americanus*), green frog (*Lithobates clamitans*), Pied-billed Grebe (*Podilymbus podiceps*), and Bald Eagle (*Haliaeetus leucocephalus*). Wildlife observations are summarized in Appendix 2E.

2.7 BENTHIC MACROINVERTEBRATE COMMUNITY ASSESSMENT

In 2018, benthic community data were collected for the first time post-remediation to document recolonization of new cap substrate placed during remediation. Benthic macroinvertebrates were collected from representative areas within remediation areas, the CSX shoreline area, and unremediated areas of the lake (Figures 2.9A through 2.9C) as per the OLMMP.

Sampling methods followed NYSDEC sampling procedures (NYSDEC 2018). Multiplates were deployed on July 12 and 13, 2019. Units were left in the water for five weeks and collected on August 16, 2019. A petite ponar was used in areas of soft substrate and sediments, while a multiplate was used in areas of coarse substrate such as gravel. Ponar samples were collected from August 16 through 29, 2019. Samples were processed in accordance with NYSDEC procedures and with the QAPP (Parsons 2018d). Organism identification was conducted by Watershed Assessment Associates. Benthic macroinvertebrate data are provided in Appendix 2E.

Biological Assessment Profile (BAP) scores were calculated from the benthic macroinvertebrate community data provided by Watershed Assessment Associates following the NYSDEC Standard Operating Procedure (SOP) for Biological Monitoring of Surface Waters in New York (NYSDEC 2018). Individual benthic macroinvertebrate community metrics, as specified in the SOP, were calculated and fitted to the applicable scales described in the SOP for petite ponar and multiplate sampling, respectively. The metrics were then converted to a common scale from zero to ten, with zero indicating the lack of a benthic community, and ten being comparable to a reference/pristine benthic invertebrate community. The overall score for the samples were then averaged with their location replicates (as applicable) and presented as an average for each area of the lake.

Average BAP scores from ponars ranged from 1.3 to 3.4 in the remediated areas and from 1.4 to 3.6 in the unremediated areas of the lake. Remediated and unremediated areas of the lake had identical overall average BAP scores of 2.6, indicating the remediated areas are developing a macroinvertebrate community consistent with other comparable locations in Onondaga Lake. Multiplates, which were only utilized in remediation areas to facilitate the sampling of coarser substrates, had an average score of 2.3, which is very similar to the ponar sample results. While the average BAP score in both remediated and unremediated areas were lower in 2018 than in baseline sampling, the substrate, lake bathymetry, sampling locations, and methods are different than these historical locations, which make direct point-to-point comparisons impractical. BAP scores from each location as well as a summary of averages can be found in Table 2.5. Results between replicates were highly variable throughout the lake and by sampling method. The variability of results in remediation areas likely stems from newly placed cap material in many areas, and the continuing recolonization of the benthic communities in these sediments. As it is believed that recolonization of capped areas is still ongoing, it is recommended that the next benthic macroinvertebrate sampling event take place in 2020.

2.8 MAINTENANCE AND RESPONSE ACTIONS

Maintenance and response actions consisted of such activities as invasive plant control and supplemental plantings. Invasive plant control focused on species like common reed (*Phragmites australis*), purple loosestrife (*Lythrum salicaria*), and water chestnut (*Trapa natans*). Supplemental plantings in 2018 included bare root trees/shrubs and plugs of primarily emergent wetland species. Approximately 200 bare root trees/shrubs, 400 pounds of seed, and 23,000 plugs were planted on the spits and shoreline around the mouth of Ninemile Creek (Appendix 2B). In the Outboard/Harbor Brook area, approximately 600 bare root trees/shrubs, 400 pounds of seed, 500 potted woody plants, and 42,000 plugs were installed. Table 2.6 contains a comprehensive list of the 2018 site maintenance tasks.

Unusually high-water levels during the 2017 growing season (average 0.7 foot above normal between May and July) appeared to have caused coverage of some emergent vegetation species at the Mouth of Ninemile Creek to retract compared to what was present at the end of the 2016 season. This was contrary to the vegetation expectations and goals for this area. The greatest impacts were observed at the Ninemile Creek spits. Supplemental plantings were completed in 2017 to address this issue as described in the 2017 annual report (Parsons 2018c). Additional supplemental plantings were installed from May through July 2018. Emergent and floating aquatic species were planted in sparse areas in the Mouth of Ninemile Creek and Outboard/Harbor Brook. The initial results of these plantings were successful. The cover in both areas increased, as shown by the August 2018 quantitative vegetation data presented in Section 2.2.

2.9 RECOMMENDATIONS FOR 2018

The 2018 habitat monitoring and maintenance program has been effective. Therefore, monitoring should continue as described in the OLMMP. Based on the data presented in this report, it is also recommended that some of the deeper areas of the wetland planted zones in both the Mouth of Ninemile Creek and Harbor Brook/Outboard should receive supplemental plantings to increase overall plant cover (Figures 2.10, 2.11, and 2.12). All wetland areas will be monitored in early spring for sparsely vegetated areas, and supplemental plantings will be completed. Additionally, it is recommended that one large tree that did not survive the 2018 growing season be replaced.

SECTION 3

BIOTA TISSUE

3.1 INTRODUCTION

Honeywell has monitored chemical concentrations in the tissue of biota in Onondaga Lake annually since 2008. Tissue monitoring is part of the basis for evaluating the effectiveness of the lake bottom remedy identified in the ROD. Tissue monitoring provides data to support decisions regarding the attainment of remedial goals and to assess remedy effectiveness by comparing post-remediation fish tissue data to the performance criteria, which are discussed in Section 4 of the OLMMP.

This section discusses biota tissue sampling activities and results from the 2018 monitoring period. Monitoring in 2018 included the following:

- Collection and analysis of sport fish, large prey fish, and small prey fish tissue
- Collection and analysis of zooplankton tissue

As discussed in the OLMMP, this section also provides a comprehensive discussion comparing annual results to performance criteria and baseline results. Trends were evaluated to support the preparation of USEPA's Five-Year Review Report, including consideration and discussion of results from 2008 through 2018. Detailed discussion of activities and results from were provided in the following annual monitoring reports:

- Onondaga Lake Tissue and Biological Monitoring Report for 2014 (Parsons and Anchor QEA 2018)
- Onondaga Lake Tissue and Biological Monitoring Report for 2015 and 2016 (Parsons and Anchor QEA 2018a)
- Draft Onondaga Lake Monitoring and Maintenance Report for 2017 (Parsons 2018c)

The relevant performance criteria are as follows:

- Mercury concentrations in Onondaga Lake sport fish fillet samples that are protective of human health (0.3 and 0.2 milligrams per kilogram [mg/kg] wet weight)
- Mercury concentrations in Onondaga Lake prey fish whole body samples that are protective of wildlife (0.14 mg/kg wet weight)

These performance criteria are compared herein to the mercury concentrations in fish by species. As stated in the ROD (NYSDEC and USEPA 2005), these criteria address the remedial action objective to be "protective of human health by eliminating or reducing, to the extent practicable, potential risks to humans." The ROD states that "A result of such a reduction could be that humans may consume fish in accordance with the state's general advisory for eating sport fish, which states that an individual eat no more than one meal (one-half pound) per week."

Additionally, concentrations of organic compounds documented in Table 7 of the ROD (NYSDEC and USEPA 2005), including PCBs in sport fish and prey fish, dioxins/furans in sport fish, and DDT and metabolites in prey fish, are considered as points of reference (i.e., targets) for future evaluations of risk reduction for human and wildlife consumers of fish. The ROD estimated that concentrations of contaminants in fish will be reduced within 10 years following completion of remedial activities (i.e., by 2026).

Sampling and analyses in 2018 were generally conducted in accordance with the Biota Tissue Sampling Work Plan, which was included in Appendix B of the OLMMP (Parsons 2018b), and with the Draft QAPP for Onondaga Lake, Geddes Brook, Ninemile Creek, and LCP OU-1 Media Monitoring (Parsons, Upstate Freshwater Institute [UFI], and Eurofins Lancaster Laboratories 2017) approved by NYSDEC. There were some minor deviations from the Biota Tissue Sampling Work Plan, which are detailed further below.

The 2018 monitoring results in fish and zooplankton are summarized in Section 3.2 below. The comprehensive review of data called for in the OLMMP to facilitate the next USEPA Five-Year Review Report is presented in Section 3.3. The comprehensive review compares annual results to baseline data and performance criteria and presents observations of temporal trends in fish and zooplankton tissues.

3.2 2018 MONITORING RESULTS

3.2.1 Fish

Sampling and Analysis Methodology

Sampling for tissue chemical analyses was conducted at the eight general locations from 2008 to 2017 (Figure 3.1). Adult sport fish were collected between May 23 and July 31, 2018, large prey fish were collected between May 23 and July 27, 2018, and small prey fish were collected between August 2 and August 28, 2018.

Twenty-five individuals from each of the following four species of adult sport fish (100 total samples) were targeted for tissue chemical analysis: Pumpkinseed (*Lepomis gibbosus*), Walleye (*Sander vitreus*), Smallmouth Bass (*Micropterus dolomieu*), and Common Carp (*Cyprinus carpio*). Samples were collected to target three to four individual fish of each species at each location. Fish were targeted based on the sizes specified in the OLMMP (Parsons 2018b). Prey fish sampling included collection of both small and large prey fish (White Sucker [*Catostomus commersonii*]). Species of small prey fish were determined based on the availability at the time of sampling and included 18 Banded Killifish (*Fundulus diaphanus*) composites and six Round Goby (*Neogobius melanostomus*) composites.

Samples were collected using the methods outlined in the OLMMP, dependent upon the target species and size. Otoliths (small ear bones) from each Smallmouth Bass, Walleye, and Common Carp, and scales from each adult Pumpkinseed, were collected to estimate fish age. Total length (in millimeters) and mass (to the nearest gram) were recorded for each fish submitted for chemical analysis. When possible, the sex of the adult sport fish and large prey fish was determined in the laboratory.

The analytical work scope for tissue samples was consistent with the scope outlined in Appendix B (Biota Tissue Sampling Work Plan) of the OLMMP (Parsons 2018b). The commercial Eurofins Lancaster Laboratories located in Lancaster, Pennsylvania, prepared the fish samples consistent with the NYSDEC SOP for fish fillets (NYSDEC 2014). One hundred adult sport fish were analyzed for mercury, PCBs, lipid content, and percent moisture. Although the Biota Tissue Sampling Work Plan calls for all individuals to be analyzed for hexachlorobenzene (HCB), only 98 samples were analyzed due to mass limitations in two Pumpkinseed individuals. In addition, 52 adult sport fish were submitted for dioxin and furan analysis. Twenty-four composite samples of small prey fish and 24 individual large prey fish were submitted for analysis of mercury, PCBs, HCB, DDT, and metabolites, lipid content, and percent moisture.

Data validation was conducted in accordance with the Biota Tissue Sampling Plan and QAPP (Parsons et al. 2018d). Chemical analytical data generated by the laboratories were reviewed and validated by Parsons for usability in accordance with data validation procedures described in the Data Usability Summary Report (DUSR) (Appendix 3A).

Results

Chemical concentrations and lipid content in fish are summarized in Table 3.1. Dioxins and furans are provided as toxicity equivalent quotients (TEQs). Results for each fish tissue sample are provided in Appendix 3B. Chemical concentrations in fish are shown as box and whisker plots in Figures 3.2 through 3.6, and scatter plots in Figures 3.7 through 3.12. The box and whisker plots contain the following information by species and analyte: number of samples, number of detects, and minimum, maximum, mean, median, 25th percentile, 75th percentile, and 95 percent upper confidence limits (UCLs).

In 2018, mean mercury concentrations in Carp and Pumpkinseed were below the Human Health Performance Criteria of 0.2 and 0.3 mg/kg. Mean mercury concentrations in Smallmouth Bass and Walleye remained above the performance criteria, which was not unexpected because they are longer-lived, higher trophic level species that will take longer to respond to the remedy.

Mean mercury concentrations in large prey fish, represented by White Sucker, were below the Ecological Performance Criterion of 0.14 mg/kg in SMUs 3, 6, and 7, but above the criterion in SMUs 1, 4, and 5 and on a lake-wide basis.

For small prey fish, mean mercury concentrations in each SMU and on a lake-wide basis were below the Ecological Performance Criterion of 0.14 mg/kg in 2018.

3.2.2 Zooplankton

Sampling and Analysis Methodology

Zooplankton samples were collected for mercury analysis at South Deep 17 times from May 16 to November 19, 2018, at a frequency that ranged from weekly to monthly. Ten of these samples could not be analyzed for total mercury due to insufficient zooplankton biomass and were, therefore, analyzed only for methylmercury. UFI also attempted to collect samples of large (at least 1 millimeter [mm] long) *Daphnia spp.* zooplankton. Although *Daphnia* were observed on several occasions during summer 2018, the zooplankton community was generally dominated by smaller taxa, including *Bosmina*. As in previous years, *Daphnia* were not present in high enough quantities to isolate a sufficient number for mercury analysis. Although there are no remedial goals for zooplankton, analysis of mercury and methylmercury concentrations provide a measure of change in potential exposure to fish that eat zooplankton and aid in the understanding of mercury cycling.

Results

Total mercury and methylmercury concentrations measured in zooplankton collected at the South Deep location in 2018 are presented in Table 3.2 and in Figure 3.13. Wet weight total mercury concentrations measured in zooplankton during 2018 ranged from 0.0314 mg/kg (or parts per million) on July 2 to 0.167 mg/kg on July 31. Methylmercury concentrations observed in zooplankton during 2018 ranged from 0.0008 mg/kg on September 27 to 0.0094 mg/kg on June 12. Contribution of methylmercury to total mercury in 2018 ranged from 1 percent on July 31 to 27 percent on June 12 (Figure 3.14). On average, methylmercury accounted for approximately 10 percent of the total mercury in zooplankton.

3.3 Comprehensive Monitoring Results (2008 to 2018)

As discussed in the OLMMP, this report also presents the first comprehensive review of monitoring results which is to be provided every five years to support the USEPA Five-Year Reviews. Results were reviewed from the beginning of baseline monitoring in 2008, trends were evaluated over time, and results were compared to the performance criteria and to data collected during baseline and post-remedy monitoring.

Annual mean wet-weight mercury concentrations in sport fish and large prey fish are shown on Figures 3.15 and 3.16. To evaluate mercury trends in fish tissue, mercury data are also presented on a standard length basis to reduce variability in concentrations due to the size of fish collected. Concentrations in standard-length fish were calculated by determining the relationship between mercury concentration and length for each species in each year (2008 through 2018). Using these relationships, mercury concentrations were estimated for a standard length that varied by species (Figure 3.17). The standard length for each species was calculated as the mean length for all fish of that species in the 2008 through 2018 dataset (calculated by averaging the mean lengths for each respective year due to unequal sample sizes among years). Standard-length mercury temporal profiles were developed for Smallmouth Bass, Walleye, Common Carp, Pumpkinseed and large prey fish (Figure 3.18 through 3.20) using the following lengths:

- Smallmouth Bass: 416 mm
- Walleye: 538 mm
- Common Carp: 575 mm
- Pumpkinseed: 163 mm
- Large prey fish: 425 mm

Small prey fish samples were not length-standardized because multiple individual small prey fish (with similar, but not identical lengths) make up a composite sample.

Lipid-normalized plots were developed to evaluate trends of organic chemicals in fish tissue by dividing the chemical concentrations in individual fish by their respective lipid concentration.

3.3.1 Summary of Fish Tissue Trends (2008 to 2018)

Mercury

Mercury concentrations in all sport fish species have generally declined since monitoring began in 2008. Concentrations are also declining since completion of dredging and capping. The general trend is apparent in plots of both wet-weight (Figures 3.15) and standard-length (Figures 3.18 and 3.19) basis. Mean concentrations in Smallmouth Bass and Walleye on a wet-weight basis in 2018 were, respectively, less than half and approximately one-third of the concentrations in 2008. Similar declines in mercury concentrations for Smallmouth Bass and Walleye are apparent in the standard-length plots. Mercury concentrations in Smallmouth Bass and Walleye remain above the Human Health Performance Criteria of 0.2 and 0.3 mg/kg, which is expected because these are longer-lived, higher trophic level species that take longer to respond to the effects of the remedy.

Mean concentrations in Common Carp, on both a wet-weight and length-standardized basis, show a decline since initial sampling in 2014, with 2018 having the lowest value reported to date. Mean concentrations have been below the Human Health Performance Criterion of 0.3 mg/kg since 2014 and were below 0.2 mg/kg in 2017 and 2018.

Overall, mean concentrations in Pumpkinseed on a wet-weight and length-standardized basis have decreased from 2008 to 2018. The mean concentration in 2018 is the lowest yet reported and is, respectively, approximately one-third and one-half of the value in 2008, on a wet-weight and length-standardized basis. Mean mercury concentrations have been below the Human Health Performance Criteria of 0.3 mg/kg since 2010 and were below 0.2 mg/kg in 2013, 2014, and 2016 to 2018.

For large prey fish, the wet-weight mean concentration was below the Ecological Performance Criterion of 0.14 mg/kg in 2016 and 2017 (Figure 3.16), but no strong trend is evident. On a length-standardized basis, a decline in mean concentrations is evident from 2014 to 2017 (Figure 3.20).

On a lake-wide basis, mean mercury concentrations in small prey fish have declined since 2012 and have been below the Ecological Performance Criterion of 0.14 mg/kg since 2016 (Figure 3.21). On an individual SMU basis, mean mercury concentrations have declined since 2008, particularly in SMUs 2, 3, 4, and 7, which are all within remediated areas where initial concentrations were the highest. Mean concentrations have been at or below 0.14 mg/kg in all SMUs since 2016.

PCBs

PCB concentrations in Smallmouth Bass and Walleye are lower in 2017 and 2018 compared to 2014 through 2016 and 2008 through 2009 on a wet-weight and lipid-normalized basis (Figure 3.22). PCB concentrations in Pumpkinseed show no discernable trend on a wet-weight basis and are consistently low, while concentrations in Carp increased in 2015 and 2016 compared to the initial sampling in 2014 but were considerably lower in 2017 and 2018 (Figure 3.23). On a lipid-normalized basis, PCB concentrations in Common Carp are similar to Pumpkinseed, and the lowest concentrations in both species were observed in 2018.

Mean PCB concentrations in large prey fish have declined over the last four years on both a wet-weight and lipid-normalized basis; concentrations in 2018 were the lowest yet reported (Figure 3.24). In small prey fish, the 2018 concentrations in each SMU were lower than in 2008. PCB concentrations increased in several SMUs in 2013 to 2015 but have declined since then, particularly in SMUs 6 and 7 (Figure 3.25). Mean concentrations in small prey fish remain elevated in SMU 6 compared to other SMUs, as they have for most years. This may be attributed to the ongoing PCB remedy in Ley Creek, as discussed in the surface water section (Section 4.2). Ley Creek enters Onondaga Lake at the northern end of SMU 6. In 2018, the relatively high variability in lipid-normalized PCB concentrations in small prey fish from SMU 6 is caused by one unusually low lipid result (0.53 percent).

Hexachlorobenzene

HCB concentrations (both on a wet-weight and lipid-normalized basis) in Smallmouth Bass and Walleye (Figure 3.26), Common Carp and Pumpkinseed (Figure 3.27), large prey fish (Figure 3.28), and small prey fish (Figure 3.29) show no discernable trends over the collection period. Concentrations are generally low and have a low frequency of detection in most samples analyzed in the last two years. In 2018, the apparent increase in variability of HCB concentrations on a lipid-normalized basis for all fish species, except small prey fish, is due to a high number of non-detects (i.e., only six detected samples out of 146), resulting in relatively high and variable reporting limits due to matrix interference (Figure 3.9).

Dioxins/Furans

Dioxins and furans (evaluated as TEQs) in Smallmouth Bass and Walleye are generally low and have declined in concentration since baseline (Figure 3.30). Dioxin and furan TEQ concentrations in Common Carp have declined since 2014 (when this species was first sampled), while concentrations in Pumpkinseed have remained relatively unchanged (Figure 3.31).

DDT and Metabolites

Concentrations of DDT and metabolites on a wet-weight and lipid-normalized basis in large and small prey fish are low and relatively unchanged throughout the collection period (Figures 3.32 and 3.33). One unusually high concentration was reported for large prey fish in 2018 (Figure 3.10), which skewed the average concentration for SMU 4 and resulted in high variability around the mean in 2018 (Figure 3.32).

3.3.2 Summary of Zooplankton Trends (2008 to 2018)

Zooplankton methylmercury concentrations have remained consistently low since nitrate addition began in 2011 (Figure 3.34). Peak methylmercury concentrations in zooplankton spiked when nitrate was depleted from the hypolimnion in 2009 and have remained relatively low since nitrate addition began (Figure 3.35).

3.3.3 Summary of Benthic Invertebrate Tissue Results (2017)

Benthic macroinvertebrate sampling was conducted in 2017 during MNR monitoring to provide initial data on mercury and methylmercury concentrations. As discussed in the OLMMP, these may be used in future, if additional monitoring is necessary as a potential response action. Benthic invertebrates were obtained at three locations in SMU 8 on June 2 and 7, 2017, at water depths of 13 to 14 meters (Figure 3.36). Samples were classified by their taxonomic family prior to analysis. Samples from two of the locations contained individuals from the *Chironomidae* family, and the remaining sample contained individuals from the *Oligochaeta* family. Mercury and methylmercury concentrations in these samples are presented in Table 3.3.

3.4 RECOMMENDATIONS

The OLMMP specifies that annual comprehensive fish monitoring will be completed through at least 2019, therefore it is recommended that fish and zooplankton sampling continue in 2019 as specified in the OLMMP. However, as discussed above, performance criteria or target concentrations have been met for 3 consecutive years for several analytes and species, which is the basis specified in the OLMMP for determining that performance criteria have been met. Therefore, pending the 2019 sampling results, it is anticipated that discontinuation of monitoring for some analytes in some species will be recommended for 2020. The species, analytes, and rationale for the anticipated recommendations are presented in Table 3.4. These recommendations are pending an evaluation of the 2019 analytical results in conjunction with NYSDEC and will be finalized in the 2019 annual report.

SECTION 4

SURFACE WATER

4.1 INTRODUCTION

The primary objective for monitoring surface water is to provide a basis for determining achievement of the surface water performance criteria. These criteria are based on PRG #3 of the ROD (NYSDEC and USEPA 2005), which is to "achieve surface water quality standards, to the extent practicable, associated with chemical parameters of interest (CPOIs)." The performance criteria for surface water are the NYSDEC Surface Water Quality Standards (SWQS; Part 703) and Division of Water Technical and Operational Guidance Series (TOGS) Ambient Water Quality Standards and Guidance Values (TOGS 1.1.1) for mercury, select VOCs and SVOCs, and PCBs. The performance criteria goals are:

- Achieve total dissolved mercury concentrations in Onondaga Lake surface water samples that are protective of wildlife (2.6 nanograms per liter [ng/L] or less) and of human health via fish consumption (0.7 ng/L or less)
- Achieve VOC and SVOC concentrations in Onondaga Lake water samples that are protective of aquatic life (concentrations are chemical specific)
- Achieve PCB concentrations in Onondaga Lake surface water samples that are protective of wildlife (0.12 ng/L or less) and of human health via fish consumption (0.001 ng/L or less)

As per the OLMMP, which calls for a minimum two-year monitoring program to consider the criteria achieved, surface water sampling to assess compliance with the above goals was initiated in 2017 and conducted again in 2018. In both 2017 and 2018, surface water sampling to assess compliance with the above goals was conducted in accordance with the Surface Water Monitoring Work Plan, included in Appendix C of the OLMMP (Parsons 2018b) and with the QAPP (Parsons 2018d), which has been approved by NYSDEC. Consistent with the OLMMP, surface water samples were collected at 10 littoral zone locations and two mid-lake locations (Figures 4.1A and 4.1B) in both 2017 and 2018, once prior to and once after fall turnover.

During the pre-turnover events for both 2017 and 2018, samples were analyzed for unfiltered and filtered (dissolved) total mercury, unfiltered methylmercury, select VOCs and SVOCs[2], and total PCBs[3]. During the post-turnover event, samples were analyzed for unfiltered and filtered (dissolved) total mercury, unfiltered methylmercury, and PCB congeners. In accordance with the

[2] Select VOCs and SVOCs as per Table 5.1 of the OLMMP and as presented in the DUSR.
[3] PCBs were analyzed for full set of 209 congeners using USEPA Method 1668A.

OLMMP, VOCs and SVOCs were not analyzed for during the post-turnover event for either year because all results from the pre-turnover event were below the standards.

The 2017 and 2018 monitoring results are discussed below. As required by the OLMMP, these results are compared to the relevant SWQS to assess the achievement of goals.

4.2 MONITORING RESULTS FOR 2017 AND 2018 AND RECOMMENDATIONS

Pre-turnover sampling was conducted on September 14, 2018. Due to an interruption in the shipment of the original mercury samples, resampling for unfiltered and filtered (dissolved) total mercury and unfiltered methylmercury was conducted on September 20, 2018. Post-turnover sampling was conducted on November 8, 2018. Appendix 4A of this report presents the DUSR for the samples collected in 2018. Sampling details and the DUSR for the samples collected in 2017 were provided in the draft Onondaga Lake 2017 Monitoring and Maintenance Report (Parsons 2018c).

As specified in the OLMMP, attainment of unfiltered and filtered (dissolved) total mercury, VOCs, SVOCs and PCB criteria will be achieved when measured values are below SWQS for two consecutive years, including pre- and post-turnover sampling events each year. Dissolved mercury concentrations at all littoral and mid-lake locations were below both the goal of 2.6 ng/L for the protection of wildlife and below the goal of 0.7 ng/L for human health via fish consumption for both pre- and post- turnover events in 2017 and 2018 (Tables 4.1 and 4.4 and Figure 4.2). As discussed in the OLMMP, since the mercury water quality standards have been achieved for two consecutive years, the performance criterion for mercury has been attained. Therefore, termination of sampling and analysis for mercury is recommended. Monitoring for mercury and methylmercury will continue in accordance with the O&M Plan for Nitrate Addition for as long as nitrate addition is used to control mercury methylation (Parsons and UFI 2014b).

Similarly, VOC and SVOC concentrations measured in both 2017 and 2018 from all littoral and mid-lake locations were below the relevant SWQS noted in Table 5.1 of the OLMMP (Tables 4.2 and 4.5). Since all VOC and SVOC[4] water quality standards have been achieved for two consecutive years, the performance criteria for VOCs and SVOCs have been attained. Therefore, termination of sampling and analysis for VOCs and SVOCs is recommended.

Total PCBs were evaluated during pre- and post-turnover events in both 2017 and 2018 at all specified littoral and mid-lake locations using a congener-based approach to achieve low detection limits (Tables 4.3 and 4.6). Total PCBs averaged 1.15 and 1.45 ng/L during pre- and post-turnover events in 2017. Similarly, total PCBs averaged 0.69 and 1.20 ng/L, respectively, during pre- and post-turnover events in 2018 (Table 4.7). Concentrations were generally lower in 2018 than those

[4] The lowest achievable laboratory reporting limits for benzo(a)anthracene and benzo(a)pyrene, as specified in the QAPP and as achieved during both monitoring events, were slightly above the NYSDEC guidance values noted in Table 5.1 of the OLMMP. However, since the detection limits are the lowest practically achievable by the laboratory, and the compounds were not detected, the goals for these SVOCs are also considered achieved.

observed in 2017. These observed concentrations are above both the criteria for the protection of wildlife (0.12 ng/L) and the protection of human health via fish consumption (0.001 ng/L).

The measured total PCB concentrations are not unexpected given that PCB levels in Great Lakes rainwater has been measured at concentrations between 0.5 and 20 ng/L, with general background levels of PCBs in surface water in Lake Ontario ranging from 0.19 to 0.25 ng/L (ATSDR 2000). Therefore, as discussed in the OLMMP, the achievement of the PCB goals of 0.12 and 0.001 ng/L is likely not be practicable. Some of the highest total PCB concentrations observed in the Lake were noted at the monitoring location that is closest to the discharge point of Ley Creek (SW-03). Ley Creek has multiple operable units unrelated to Honeywell that are known PCB sources for which the remediation process is ongoing (USEPA 2014, NYSDEC and USEPA 2015). Therefore, additional monitoring is recommended to evaluate PCB concentrations in the surface waters of Onondaga Lake and within incoming water from sources such as Ley Creek and other tributaries to facilitate evaluation of their impacts on PCB concentrations in Onondaga Lake. Given the time required to develop and receive NYSDEC approval on an expanded PCB sampling program, it is recommended that this additional monitoring be initiated in 2020. The proposed scope of this monitoring will be submitted to NYSDEC under separate cover for review and approval in advance of the 2020 field season.

4.3 ONONDAGA COUNTY MONITORING FOR CALCITE AND IONIC WASTE CONSTITUENTS

The Onondaga Lake ROD lists calcite and ionic waste constituents as CPOIs. Stressors of concern include calcium, chloride, salinity, ammonia, nitrite, phosphorus, sulfide, dissolved oxygen and transparency. These stressors have been routinely monitored by Onondaga County in both the tributaries and deep portions of the lake as part of the Ambient Monitoring Program (AMP). As noted in the AMP reports from 2012 through 2015, the high concentrations of total dissolved solids (TDS) in Onondaga Lake, which include concentrations of cations and anions (calcium, chloride, sodium, sulfate and others) are primarily associated with the natural hydrogeology of the lake and not with anthropogenic effects. As per the OLMMP, the most recently approved Onondaga County AMP report (2015) was reviewed and is summarized below.

TDS measurements at South Deep are not below the Ambient Water Quality Standards (AWQS) guidance value of ≤500 milligrams per liter (mg/L) and therefore were out of compliance with AWQS in 2015. TDS reflects the concentration of major cations such as calcium, sodium, magnesium, potassium, and anions such as bicarbonate, chloride, and sulfate. Exceedance of the standard is associated with the natural hydrogeology of the lake and not with anthropogenic effects. The bedrock of Onondaga County is high in concentrations of calcium and sulfate, which contribute to the high levels of TDS in the lake and its tributaries. Ten-year (2006-2015) trends in lake concentrations show no statistically significant trends in TDS. Calcium, chloride, salinity, which are monitored separately from TDS, all showed no statistically significant trends over the 10-year period reviewed in the report (2006-2015).

Future data will be reviewed each year to evaluate results and changes to the monitoring program. Should the County no longer monitor the relevant parameters under their program, the need to monitor for these parameters under the lake monitoring program will be discussed with NYSDEC, as described in the OLMMP.

4.4 SUMMARY AND RECOMMENDATIONS

As discussed above, surface water criteria for mercury, VOCs and SVOCs have been achieved, therefore termination of monitoring for these parameters is recommended. However, due to the observed PCB concentrations, it is recommended that additional monitoring for PCBs be conducted in 2020, including monitoring of tributaries to facilitate evaluation of their impacts on PCB concentrations in Onondaga Lake. The proposed scope of this monitoring will be submitted to NYSDEC for review and approval under separate cover in advance of the 2020 field season.

SECTION 5

MONITORED NATURAL RECOVERY

5.1 INTRODUCTION

MNR is a significant component of the remedy for the sediment in Onondaga Lake's profundal zone, which is also referred to as SMU 8. Water depths in SMU 8 are greater than 30 ft., where waters typically stratify thermally from mid-May through mid-October. Natural recovery occurs gradually as older sediment is buried by new sediment with lower mercury concentrations that enter the lake through tributary inflows and direct runoff. Results from monitoring conducted in 2017 and prior years indicate that natural recovery of SMU 8 sediments is progressing faster than expected based on projects made in the Final Design.

Sediment sampling in SMU 8 for mercury analysis is conducted every three years to monitor ongoing natural recovery in accordance with the final design for the lake bottom remedy (Parsons and Anchor QEA 2012). Sediment sampling was last conducted in 2017 and is scheduled to occur next in 2020.

Sampling and analysis of particles that settle through the water column and ultimately settle in SMU 8 is completed annually using sediment traps. Provided below is a detailed discussion of the activities and results from the 2018 sediment trap sampling, as well as a comprehensive summary of the activities and results from MNR-related sampling conducted over the last five years (2014 through 2018). Detailed discussion of activities and results from prior years is provided in the following documents:

- Onondaga Lake 2014 Monitored Natural Recovery Data Summary Report (Parsons 2016)
- Onondaga Lake Monitored Natural Recovery Data Summary Report for 2015 (Parsons and AQEA, 2017)
- Draft Onondaga Lake 2017 Monitoring and Maintenance Report (Parsons 2018c)

5.1.2 Overview of Monitoring Activities

This report summarizes activities conducted over the last five years (2014-2018) to support the USEPA Five-Year Review, which is to be released in 2020. Monitoring conducted over the last five years includes the following:

- Analysis of surface sediments for total mercury
- Sediment trap sampling and analysis for mercury and suspended solids analysis
- Collection and assessment of sediment cores from microbead plots to assess sedimentation rates and mixing depth

- Collection and identification of benthic macroinvertebrates

The primary objective of sediment sampling is to provide a basis for determining achievement of the Preliminary Remedial Goals (PRGs) set forth in the ROD (NYSDEC and USEPA 2005). This includes achieving a mercury probable effects concentration (PEC) of 2.2 mg/kg or lower on a point-by-point basis in the profundal zone and the mercury bioaccumulation-based sediment quality value (BSQV) of 0.8 mg/kg or lower on an area-wide basis within 10 years following remediation of upland sources, littoral sediments, and thin-layer capping in portions of the profundal zone. The mercury BSQV is assessed over five subareas of the lake bottom that include both the profundal and littoral zones. The five lake subareas from north to south are designated as North Basin, Ninemile Creek Outlet, Saddle, South Basin, and South Corner, as shown in Figure 5.1A and B.

In addition to the above, monitoring to assess the processes controlling the progression of natural recovery also includes evaluations of the depth of mixing of surface sediments, sedimentation rates, and the concentrations on the settling particles. Fluorescent microbead markers were placed in nine plots in SMU 8 in mid-2009. These provide a visual top of sediment demarcation for that timeframe that can be compared with future sediment depths. To conduct assessments of mixing and sedimentation, cores were collected from microbead plots every three years, frozen in an upright position, and subsequently sectioned and visually inspected. Additionally, sediment traps were deployed annually to provide supplemental information to assess sedimentation rates and quantify the mercury concentrations on settling sediments. Benthic macroinvertebrate studies for both community composition and mercury concentrations have also been conducted in recent years. These sampling programs are described in more detail below.

5.2 2018 MONITORING

Sediment traps were deployed at the South Deep sampling location at a water depth of approximately 33 ft. (or 10 meters), which is below the thermocline for most of the summer stratification period. Sediment trap samples were collected continuously over the deployment intervals, and the slurry from the sediment traps was analyzed by Eurofins for low-level total mercury and by UFI for total suspended solids and total fixed solids. The 2018 sampling and analyses were conducted in accordance with the MNR Sampling Work Plan included in Appendix A of the OLMMP (Parsons 2018b) and with the QAPP (Parsons 2018d) as approved by NYSDEC. There were no deviations from the work plan in 2018.

Sampling was conducted from May 8 through November 7, 2018. Deployments ranged from five to seven days in length, with the final sediment trap deployment spanning 12 days (November 7 to November 19). Table 5.1 presents mercury and total suspended solids data from 2018. The average deposition of suspended solids in 2018 was 11,788 mg per square meter per day, which is higher than the 6,850 mg per square meter per day assumed in the Final Design (Parsons and Anchor QEA 2012). Mercury concentrations in settling sediments averaged 0.18 mg/kg, which is lower than the mercury concentration of 0.4 mg/kg used in the natural recovery modeling conducted during the Final Design (Parsons and Anchor QEA 2012). A DUSR for these data is presented in Appendix 5A.

5.3 TRACKING PROGRESS OF NATURAL RECOVERY

As discussed in the OLMMP, a comprehensive review of monitoring results is to be provided every five years, beginning in 2019, to support the USEPA Five-Year Review process. The following components of the MNR program are discussed in detail in the subsections that follow:

- Assessments of surface sediment mercury concentrations compared to performance criteria based on recent data
- Evaluations of sedimentation from settling sediments and evaluations of mercury concentrations in settling sediments
- Evaluations of sediment mixing depth
- Evaluations of the density of the benthic community in SMU 8 sediments

Work was completed in accordance with the approved annual work plans (2014-2016) and in accordance with the OLMMP (2017-2018).

5.3.1 Assessments of PEC and BSQV

Mercury concentrations measured in 2014 and 2017 in surface (0 to 4 centimeters [cm]) and subsurface (4 to 10 cm) sediments throughout SMU 8 are listed in Table 5.2. Boring logs for these sediment sampling events are included in Appendix 5B. In general, mercury concentrations measured in 2017 are less than those measured in 2014, confirming ongoing natural recovery of sediments in SMU 8. Mercury concentrations are generally at or below the PEC of 2.2 mg/kg in all sediment samples. Only one sample concentration was greater than 2.2 mg/kg, and that sample was located in the South Basin (OL-STA-80238) at the 4- to 10-cm depth interval and had an observed concentration of 2.55 mg/kg. The following mercury concentrations were detected in surface and subsurface sediment in 2014 and 2017:

- 2014 (0 to 4 cm): 0.6 to 1.3 mg/kg
- 2014 (4 to 10 cm): 0.9 to 1.6 mg/kg
- 2017 (0 to 4 cm): 0.4 to 1.4 mg/kg
- 2014 (4 to 10 cm): 0.2 to 2.6 mg/kg

Where applicable, Table 5.2 compares 2017 SMU 8 measured surface sediment mercury concentrations and model-predicted surface sediment mercury concentrations from the final design. Of the 22 sediment locations sampled in 2017, 14 were modeled as part of the final design analysis. Measured mercury concentrations in 2017 are lower than the model predicted to occur in 2017 at all sampled locations, indicating that recovery of profundal zone sediments is occurring faster than predicted. Reasons for the increased rate of recovery are discussed in the subsections that follow.

Area-weighted average mercury concentrations were calculated for the five sub-basins of Onondaga Lake, which include the profundal zone and littoral zone, for comparison to the BSQV. Two methods were used to calculate the area-weighted average concentrations in each sub-basin. The first method (Method 1) relied on the 2017 SMU 8 surface sediment samples only to calculate area-weighted average concentrations in the SMU 8 portion of each sub-basin. Because the data density was less than the data density used to calculate the area-weighted average concentration during the final design, a second method (Method 2) was employed, which used the SMU 8 data from the final design and assigned a mercury concentration to each location based on a percent reduction that has occurred since that time. Percent reductions were calculated by comparing the surface sediment mercury concentrations measured during the 2017 sampling to the surface sediment mercury concentrations from co-located sample locations measured as part of the pre-design investigation (PDI).

The following datasets were used to develop the area-weighted average surface sediment mercury concentrations inclusive of SMU 8 and littoral zone capped and uncapped areas:

- 2017 SMU 8 surface sediment samples
- PDI SMU 8 surface sediment samples (Method 2 only)
- 2017 and 2018 cap monitoring samples collected within the 0 to 15 cm depth interval within the littoral zone (0- to 6-inch samples and 3- to 6-inch samples included) and 0- to 4-cm depth interval for locations within the profundal zone
- Remedial investigation samples collected within the 0- to 15-cm depth interval from locations within the littoral zone outside the cap areas

For Method 2, percent reductions applied to the PDI sampling locations were calculated for each sub-area as presented in Table 5.3. Where 2017 samples exist, those were used in place of the PDI sample concentration with reduction. Areas of influence (based on Thiessen polygons) for each sample location are presented in Figure 5.2 (Method 1) and Figure 5.3 (Method 2). Areas of influence were defined for the profundal zone, non-cap areas, and each cap type separately. For example, the area of influence for a sample collected in SMU 8 does not extend beyond the boundary of non-capped areas in SMU 8.

Regardless of method used, the analysis indicates that the area-weighted average surface sediment mercury concentrations have declined to values less than or equal to the mercury BSQV of 0.8 mg/kg in all five sub-basins of Onondaga Lake. Surface sediment area-weighted average concentrations across Onondaga Lake in each of the five Lake zones are presented in Table 5.4 for Methods 1 and 2. The area-weighted mercury concentrations are less than predicted to occur by 2017 during the final design, indicating that recovery is occurring at a faster rate than predicted.

5.4 ASSESSING PROCESSES CONTROLLING NATURAL RECOVERY

Natural recovery in SMU 8 sediments is controlled by mixing depth and sedimentation rates (i.e., burial). Sampling was conducted to evaluate the mechanisms that control natural recovery, including core collection in microbead plots to evaluate mixing and sedimentation and sediment traps to evaluate sedimentation and mercury concentrations on settling particles.

5.4.1 Evaluation of Sedimentation Rates in SMU 8

In June and July 2009, microbead markers were deposited on top of profundal zone sediments at nine 1,400-square-foot plots located in the deep-water zone of Onondaga Lake to assess sedimentation rates in SMU 8. Sedimentation rates were estimated from cores collected in the microbead plots by measuring the thickness of sediment that accumulated on top of the microbead marker. Sediment cores have been collected periodically (2011, 2014, 2015, and 2017) since the microbead plots were established. The cores were visually inspected for the green microbead marker. Sediment accumulation on top of the microbead marker was measured to estimate the sedimentation rate using the following formula:

$$S = \frac{T}{t} \cdot \rho_b$$

Where,

S = sedimentation rate (in grams per square centimeter per year [g/cm^2/year])

T = thickness of sediment accumulation (cm)

t = time over which accumulation occurred (years)

ρ_b= dry bulk density (in grams per cubic meter [g/cm^3])

Results from the 2014, 2015 and 2017 events are summarized in Table 5.5 and Appendix 5C. The results indicate that sedimentation rates range from 0.04 to 0.32 g/cm^2/yr, with an average of 0.16 g/cm^2/yr. The sedimentation rate of 0.25 g/cm^2/year used in the final design natural recovery modeling is within the range measured in 2014, 2015 and 2017.

Sediment traps were deployed at a location in the South basin (South Deep) from May through October each year. The average deposition of suspended solids from 2014 through 2018 ranged from 9,812 to 17,800 mg per square meter per day (mg/m^2/day), all of which are higher than the solids deposition rate of 6,850 mg/m^2/day (or 0.25 g/cm^2/year) used in the MNR modeling conducted as part of the final design. Sediment traps measure gross sedimentation rates. Sedimentation rates measured by this method are therefore higher than in situ methods, such as those measured using the depth to microbead marker. Results are tabulated in Table 5.6 and shown in Figure 5.4. It was suggested in the 2014 and 2015 annual reports (Parsons 2016; Parsons and Anchor QEA 2017) that it is possible suspended material from capping activities may have increased sediment deposition in the sediment traps through the completion of capping activities in 2016. However, evaluations of sedimentation rates in 2017 and 2018 show that sedimentation rates are within the range observed during capping activities, indicating that capping activities are not likely to be the cause for higher sedimentation measured in prior years in the profundal zone.

5.4.3 Evaluation of Mercury Concentrations on Settling Sediments

Average mercury concentrations in sediment settling in SMU 8 from 2014 through 2018 ranged from 0.18 to 0.44 mg/kg, with an average of 0.45 (Table 5.6). In recent years (2017 and 2018), mercury concentrations were lower than the mercury concentration of 0.4 mg/kg used in the natural recovery modeling conducted during the final design (Parsons and Anchor QEA 2012). These lower mercury concentrations result in lower concentrations at the surface sediments and therefore result in faster recovery of SMU 8 sediments.

5.4.2 Assessment of Mixing Depth

To assess mixing depths in SMU 8, cores were collected from profundal zone sediments in 2014, 2015 and 2017, frozen in an upright position, and subsequently sectioned and visually inspected for laminations. The presence of layers or laminations in the SMU 8 sediment is primary evidence that SMU 8 sediment is relatively undisturbed and not affected by bioturbation or resuspension of lakebed sediment. Visual inspection of the cores focused on the upper portion of the core where observations are representative of more recent lake mixing conditions. Based on observations of laminations from the cores collected from SMU 8 in 2014, 2015 and 2017, mixing depths range from 0.1 to 7, with an average of 1.5 (Table 5.5). These depths are less than the mixing depth assumed in the MNR modeling conducted as part of the final design (Parsons and Anchor QEA 2012).

As Onondaga Lake recovers, there is potential for increased density in benthic organisms, which could in turn lead to increased mixing in SMU 8 sediments. Therefore, the benthic macroinvertebrate community was monitored and compared to previous years to understand the potential for increased mixing depth. In 2015, the benthic macroinvertebrate community was documented in SMU 8 at three different water depths along three transects, as well as two deeper locations. These results are fully described in the Onondaga Lake 2015 Monitored Natural Recovery Data Summary Report (Parsons and Anchor QEA 2017).

Most (greater than 95 percent) organisms collected during the June and August 2015 sampling events were chironomids and oligochaetes (Tables 5.7 and 5.8). Considerable variability was observed among grab samples at most locations. Macroinvertebrate densities were generally lower at profundal zone locations in the deepest water compared to the most-shallow water depths along the transects. Profundal zone macroinvertebrate densities observed in 2015 (mean of approximately 1,300 organisms/square meter) were higher than those reported in 1992 and 2000 for water depths greater than 7.5 meter (mean of 36 organisms/square meter) suggesting an improvement in the profundal macroinvertebrate community. The observed densities do not appear to be contributing to significant bioturbation, as evident from the mixing depth estimated from the frozen cores. Differences in sampling months, locations, and water depths preclude more detailed comparisons among years.

Benthic macroinvertebrates were collected from three locations in 2017 and analyzed for total mercury as well as methylmercury as specified in the OLMMP. These results are discussed in Section 3 (Biota Tissue) of this report.

5.5 SUMMARY OF RESULTS AND RECOMMENDATIONS

Based on results from the 2017 and 2018 monitoring events and an evaluation of the comprehensive data set, natural recovery of SMU 8 sediments is progressing faster than anticipated based on projections completed as part of the Final Design, and MNR sediment-based goals may have already been achieved. Therefore, it is recommended that the 2020 sediment monitoring event be completed for compliance verification. This will entail sampling from a higher number of sampling locations than was completed during prior sampling events, as detailed in the Monitored Natural Recovery Work Plan in the OLMMP. The 2020 sampling would be the first year of two compliance sampling events. If the 2020 sampling indicates SMU 8 sediments have achieved remedial goals, a second compliance sampling event would occur in 2021 consistent with the compliance sampling protocol in these areas. Collection of cores from microbead plots will also be performed in 2020 in accordance with the OLMMP. Additionally, sediment trap monitoring should continue on an annual basis, as described in the OLMMP.

SECTION 6

CAP MONITORING

Cap physical and chemical monitoring was conducted in 2017 and 2018 to verify that the cap remains protective. Provided below are the detailed activities and results from the 2018 physical and chemical monitoring and a comprehensive summary of the activities and results from 2017 and 2018 combined. Detailed discussion of activities and results from 2017 are provided in the draft Onondaga Lake 2017 Monitoring and Maintenance Report (Parsons 2018c).

Results from the 2017 and 2018 comprehensive physical monitoring programs verify that the cap remains physically stable. Based on the monitoring results, there has been no significant loss of cap material in any of the capped areas and the cap remains stable. Consistent with the OLMMP, comprehensive physical monitoring will again be completed in 2019. Recommended minor modifications to the comprehensive physical monitoring program from what was specified in the OLMMP are detailed below.

Results from the 2017 and 2018 chemical monitoring programs verify that there is no evidence of significant chemical migration through any of the capped areas, and the cap remains protective of human health and the environment. Consistent with recommendations in the draft Onondaga Lake 2017 Monitoring and Maintenance report, comprehensive chemical monitoring of the cap will be completed in 2019. Recommended minor modifications to the comprehensive chemical monitoring program from what is specified in the OLMMP are detailed below.

6.1 PHYSICAL MONITORING

Comprehensive physical monitoring of the cap and WB 1-8 shoreline stabilization area was completed in 2017 and 2018 consistent with the scope and schedule detailed in the OLMMP. Results of the 2017 and 2018 physical monitoring verify that the cap remains physically stable. Results also indicate that there has been no significant loss of cap material in any of the capped areas. However, in isolated areas, additional 2019 data collection beyond what is specified in the OLMMP is recommended to verify this, as discussed in Section 6.1.4. Specific activities that were conducted in 2017 and 2018 include:

- Shoreline inspections and photo documentation on foot and by aerial drone
- Physical probing
- Bathymetric surveys
- Measurement of cap thickness based on collected cores

Results of these routine physical monitoring activities are discussed in detail in Sections 6.1.2 through 6.1.4.

The monitoring program also includes event-based monitoring if any of the following three extreme events occur:

- A 50-year or greater wind-generated wave event
- A 50-year or greater tributary flow event
- A seismic event measuring 5.5 or higher within 30 miles of Onondaga Lake

As detailed in Appendix 6A, none of these conditions have been exceeded since cap construction was completed. The Honeywell team is also not aware of any human activities during the reporting period that may have impacted the cap and/or other components of the remedy. Therefore, no event-based cap monitoring has been required.

6.1.1 Modifications from Planned Work Scope

Modifications to the 2017 physical monitoring work scope are documented in the draft Onondaga Lake 2017 Monitoring and Maintenance Report. These modifications were relatively minor and did not impact the ability to assess the physical performance of the cap.

Modifications to the 2018 physical monitoring work scope consisted of the following:

- Additional cores were collected in select areas of Remedial Areas (RAs) D and E based on 2018 bathymetry measurements, as shown in Figures 6.16 and 6.19.
- Additional cores were collected in select areas of RA-B and RA-C for measurement of the thickness of the fine gravel layer, as detailed in Section 6.1.4.
- Some of the physical probing transects in shallow water areas of RAs B, C and D could not be completed because low water levels prevented boat access in these areas. However, visual inspections of these areas from the shoreline verified the presence of coarse habitat/erosion protection material in these areas.
- Elevation measurements of the connected wetland berm, Harbor Brook transects and RA-E wave dampers were not collected. These elevations will be measured in 2019.

6.1.2 Shoreline Inspection Result

Inspections were performed in 2017 and 2018 by boat and by foot from the shoreline and using a small unmanned aerial system (sUAS, or “drone”), to document the integrity of the shoreline areas where remedial activities were implemented. Inspections were completed when water levels were at elevation 363.5 ft. or less (North American Vertical Datum of 1988 [NAVD88]). The areas inspected included shoreline capping areas in RAs A, B, C, D, and E, the Outboard Area (including the berms), the WB 1-8 connected wetland (including the berms), the Ninemile Creek spits, the WB 1-8 shoreline stabilization area, and the capped cultural resources located in the shallow areas of RA-E. Areas that could not be adequately inspected from the shoreline were inspected from a boat. In 2017, photographs were taken every 25 ft. along the shoreline. Photographs taken in 2018 were limited to identification/photograph documentation of any noted anomalies, consistent with the OLMMP and with NYSDEC concurrent. No signs of significant erosion or other potential significant issues were noted in either 2017 or 2018 based on the shoreline inspections. Ground-level and aerial photographs from 2017 are included electronically in the draft 2017 Onondaga Lake Monitoring Report. Ground-level and aerial photographs from 2018, respectively, are included in electronic format in Appendices 6B and 6C.

6.1.3 Physical Probing Results

Consistent with the OLMMP, the presence of coarse gravel- or gravelly cobble-sized armor stone in the coarse gravel and gravelly-cobble areas the cap must be verified. Since these cap materials are too coarse to core through, cap probing was implemented in 2017 and 2018. The consistent presence of coarse materials was verified along the OLMMP-specified probing transects completed in 2017 and 2018. Probing was conducted along the transects shown in Figures 6.1 through 6.6 by manually tapping the cap at 25-foot intervals with a steel plate attached to rods. In probing areas where the water depth, water clarity and/or vegetation cover did not interfere, the presence of the coarse substrate was also verified to the extent possible based on visual observations from the water surface. Probing and visual inspection were also conducted directly adjacent to shoreline tributaries and outfalls to verify the cap remains physically stable at these locations.

6.1.4 Bathymetry Survey and Coring Results

Comprehensive bathymetric surveys were conducted for capped areas in 2017 and 2018 consistent with methods and coverage areas specified in the OLMMP. Minor exceptions were associated with shallow areas where vegetation prevented access in 2017. Bathymetry in these areas was measured as part of the 2018 comprehensive bathymetry measurements. The surveys were conducted on transect lines running perpendicular to the slope and spaced 30 ft. apart (Figures 6.1 through 6.6), repeating every other survey line that was established during the collection of as-built data during construction. In areas that were too shallow for boat-based surveying (e.g., where the cap meets the shore), elevations were manually surveyed by wading and using conventional survey techniques.

Within topsoil areas in RA-A, the Ninemile Creek spits, Outboard Area wetlands (including lower Harbor Brook), and the WB 1-8 connected wetlands, the survey lines were modified as necessary to collect as much data as possible in and around wetland vegetation. However, portions of these areas are too shallow and/or vegetated for a boat-based survey, and a comprehensive survey using manual methods could damage the wetland vegetation. Vegetation in these areas was inspected on a regular basis in 2017 and 2018 as part of the habitat restoration monitoring. This, in combination with cores collected in these areas and observations from the aerial drone photography, provided verification that there has not been significant erosion of material in these areas.

Comparisons of 2018 to 2017, 2018 to as-built, and 2017 to as-built bathymetries for all RAs are shown in Figures 6.7 through 6.24. Based on the bathymetry results and in consultation with NYSDEC, several of the 2017 planned chemical coring locations were relocated to locations of relatively greater bathymetric change. Several additional coring locations for physical cap thickness measurements were also added in 2017, as shown in Figures 6.7 through 6.24. The 2018 cap thickness measurements based on the cap coring are provided in Table 6.1. The 2017 cap thickness measurements based on the cap coring are included in Appendix 6D. Based on a comprehensive review of the bathymetry survey results, probing results, and originally-planned and additional coring results, there has been no significant loss of cap material in any capped area and the cap remains physically stable. Bathymetry changes greater than 0.5 ft. shown on Figures 6.7 through 6.24 are generally attributable to settlement of the underlying sediment as a result of the weight of the cap and/or a result of loss of finer-grained habitat material overlying the coarser erosion protection layer. Such changes were anticipated in the final design. Figures 6.7 through 6.24 include the anticipated 2019 coring locations to be completed as part of the comprehensive chemical monitoring program. The figures also include additional data collection recommended for 2019 to verify that none of the bathymetry changes are a result of significant loss of erosion protection layer material. Figure 6.25 depicts 2018 and proposed 2019 physical monitoring locations in RA-B Zone 2.

A total of 177 cores were collected in multi-layer cap areas in 2017. With one minor exception, all individual layer and cap thicknesses measured in multi-layer capped areas in 2017 (Appendix 6D) met or exceeded the target thickness goals specified in the OLMMP. The exceptions are two duplicate cores where the measured erosion protection layer thickness was one inch less than the target thickness specified in the OLMMP. These cores are in Modified Protective Cap (MPC) area RA-C-2A (4 to 10 ft.), where additional coring was completed in 2018, as discussed below.

Coring was completed at 13 initial multi-layer cap locations in 2018, coinciding with the peeper chemical sampling locations in RAs B, C, D and E. All individual layer and cap thicknesses measured in multi-layer capped areas in 2018 in RAs D and E met or exceeded the target thickness goals specified in the OLMMP. Erosion protection layer thickness measurements from initial cores in Zone 2 of RA-B and in Model Area RA-C-2A (4 to 10 ft.) were less than target thickness goals. Therefore, additional cores were collected throughout these small areas. As shown in Figures 6.25 and 6.26 and Table 6.1, the fine gravel thickness measured in several of the cores in these two small areas was less than the target thickness specified in the OLMMP. Results included three locations where no fine gravel was measured. Results of additional probing completed in this area are shown in Figure 6.27. There were areas where the probing could not verify the presence of gravel; however, the probing was completed late in the season when the significant vegetation present interfered with the probing. It is not believed that the measured reduced fine-gravel thickness is a result of material loss due to erosion based on the factors listed below.

- As shown in Figures 6.10 through 6.15, the 2018 cap surface elevations in these areas remain consistent with the as-built elevations.
- Based on erosion evaluations completed during the final design, fine gravel is required to be protective during a 100-year wind-wave event down to a cap elevation of 352.5 NAVD 88 (water depth of 10 ft. based on average lake level of 362.5 ft. mean sea level).

As shown in Figure 6.26, many of the locations where gravel thicknesses were less than expected in RA-C were in water depths greater than 10 ft., where sand was predicted to be stable even during a 100-year event, indicating loss of fine gravel in this area due to erosion is unlikely.

- The fine gravel thicknesses measured using cores may be biased low (i.e., actual fine gravel thicknesses may be greater than measured). Side-by-side evaluations completed as part of quality assurance/quality control (QA/QC) activities during cap construction indicated that fine gravel core thickness measurements were consistently lower than thicknesses determined based on pre- and post-placement elevations. As part of this evaluation, fine gravel material volume estimates based on pre- and post-placement elevations closely matched the known volume of fine gravel placed, verifying the accuracy of thicknesses based on pre- and post-placement elevations. These two areas are MPCs where stability is very sensitive to the thickness of the cap material placed. Therefore, construction over-placements of fine gravel in these areas was less than in other cap areas, which would make thickness measurements that are biased low more problematic in these areas.

Based on these coring results, additional physical measurements of the fine gravel thicknesses in these areas is recommended for 2019. Proposed activities are summarized below.

- Collection of repeat cores at all 2018 coring locations in RA-B zone 2, as shown in Figure 6.25. Measurement of the fine gravel in these locations will also be completed using a video probe to determine if gravel thickness measurement based on cores is biased low. The video probe will consist of a camera inserted into the clear plexiglass tip of a probe that allows videoing of the cap substrate as the probe is advanced through it. The thickness of the gravel can be measured based on video observations and recording of the depth of the probe as it is advanced.
- Completion of diver inspections along the transects shown in Figure 6.26 to observe the presence or absence of a gravel layer in this area.
- Pending the results of the above activities, a plan will be developed for additional gravel thickness measurements in Model Area RA-C-2A (4 to 10 ft.), subject to NYSDEC approval.

Mono-layer cap thicknesses are specified in the design based on average rather than minimum thicknesses. Target minimum thicknesses for mono-layer caps are therefore not specified in the OLMMP. A total of 128 cores were collected in mono-layer cap areas in 2017. Of these cores, 93 percent of the measured thicknesses exceeded the specified average design thickness. Measured thicknesses in the remaining cores were consistent with expectations considering construction variability and the average thickness-based goal. Core results from 2017 are provided in Appendix 6D. No coring of monolayer caps was completed in 2018.

6.1.5 Outboard Area Berm Elevation Measurements and Interim Assessment

As shown in Figure 6.31, berms were installed along the WBB/HB Outboard area shoreline that extend into open water areas off the WBB/HB Outboard area to protect the shoreline wetlands. The OLMMP specifies that an interim assessment of the effectiveness and need for the berms, including assessment of the amount of settlement, will be conducted following year two (2018) of the monitoring period.

Physical inspection of the berms in 2017 and 2018 and elevation measurement in 2018 verified that they remain intact and have not been significantly degraded due to wind/wave action or ice. The berm design heights were developed to achieve an approximate top elevation of 365 ft. (NAVD 88) following approximately three years of settlement that will result due to the weight of the berm and underlying cap material. The berms were constructed from June through October 2016, and the berm elevation measurements were completed in June 2018, approximately two years following construction. As shown in the cross-sections included in Appendix 6.E, measured elevations of the tops of the berms are consistently at or slightly below the projected three-year elevation of 365 ft. As discussed in Section 2, wetland vegetation in the WBB/HB Outboard has become well established and is progressing toward achievement of vegetation-based goals. The berms remain effective, and the need for the berms remains. This is consistent with the originally identified need for them to protect the shoreline wetlands from destruction from wind/wave action, as documented in the WB-B/HB Outboard Area Wetland Optimization Design Revision (Parsons and Anchor QEA 2016).

6.1.6 Summary of 2017 and 2018 Physical Monitoring Results and Recommendations for 2019 Monitoring

Results from the 2017 and 2018 comprehensive physical monitoring programs verify that the cap remains physically stable. Based on the monitoring results, there has been no significant loss of cap material in any of the capped areas.

Consistent with the OLMMP, comprehensive physical monitoring of the cap will be completed in 2019. As detailed above, revisions to the 2019 cap physical monitoring program from what is specified in the OLMMP consist of:

- Completion of additional physical cores and probing as shown in Figures 6.28 through 6.33 to facilitate evaluation of areas of bathymetry change.
- Collection of repeat cores at all 2018 coring locations in RA-B zone 2, as shown in Figure 6.25. Measurement of the fine gravel in these locations will also be completed using a video probe to determine if gravel thickness measurement based on cores is biased low. The video probe will consist of a camera inserted into the clear plexiglass tip of a probe that allows videoing of the cap substrate as the probe is advanced through it. The thickness of the gravel can be measured based on video observations and recording of the depth of the probe as it is advanced.

- Completion of diver inspections along the transects shown in Figure 6.26 to observe the presence or absence of a gravel layer in this area.
- Pending the results of the above activities, a plan will be developed for additional gravel thickness measurements in Model Area RA-C-2A (4 to 10 ft.), subject to NYSDEC approval.

Planned 2019 bathymetry measurement and probing activities are shown in Figures 6.29 through 6.33. The planned 2019 physical and chemical/physical core locations are shown in Figures 6.40 through 6.45.

6.2 CHEMICAL MONITORING

The OLMMP specifies that comprehensive chemical monitoring be completed in 2017, with no chemical monitoring originally scheduled for 2018. However, 13 sample locations were switched from cores to peepers based on 2017 field observations. Due to resulting schedule limitations and in consultation with NYSDEC, sampling of these 13 peepers was completed in 2018 rather than 2017. Provided below are the detailed activities and results from the 2018 chemical monitoring and a comprehensive summary of the activities and results from 2017 and 2018 combined. Detailed discussion of activities and results from 2017 are provided in the draft Onondaga Lake 2017 Monitoring and Maintenance Report.

Monitoring methodology was consistent with the draft Cap Monitoring Work Plan included as Appendix D of the 2018draft OLMMP dated, as approved by NYSDEC. Specific activities that were conducted in 2017 and 2018 include:

- Collection of samples from multi-layer, mono-layer, and thin-layer caps throughout the capped areas of the lake to document baseline conditions
- Collection and analysis of 421 porewater and solid-phase samples from 158 sampling locations
- Completion of over 7200 chemical analyses

Sampling locations are shown in Figures 6.34 through 6.39. Results from these chemical monitoring activities, discussed in detail below, verify that the cap remains protective. Appendices 6.F and 6.G of this report presents the DUSRs and detailed analytical data tables for all 2018 chemical data collected. The DUSRs and detailed analytical data tables for all data collected as part of the 2017 sampling program are included in the draft 2017 Annual Lake Monitoring and Maintenance Report. Chemical data were reviewed and validated by Parsons for usability in accordance with NYSDEC-approved data validation procedures.

6.2.1 Modifications from Planned Work Scope

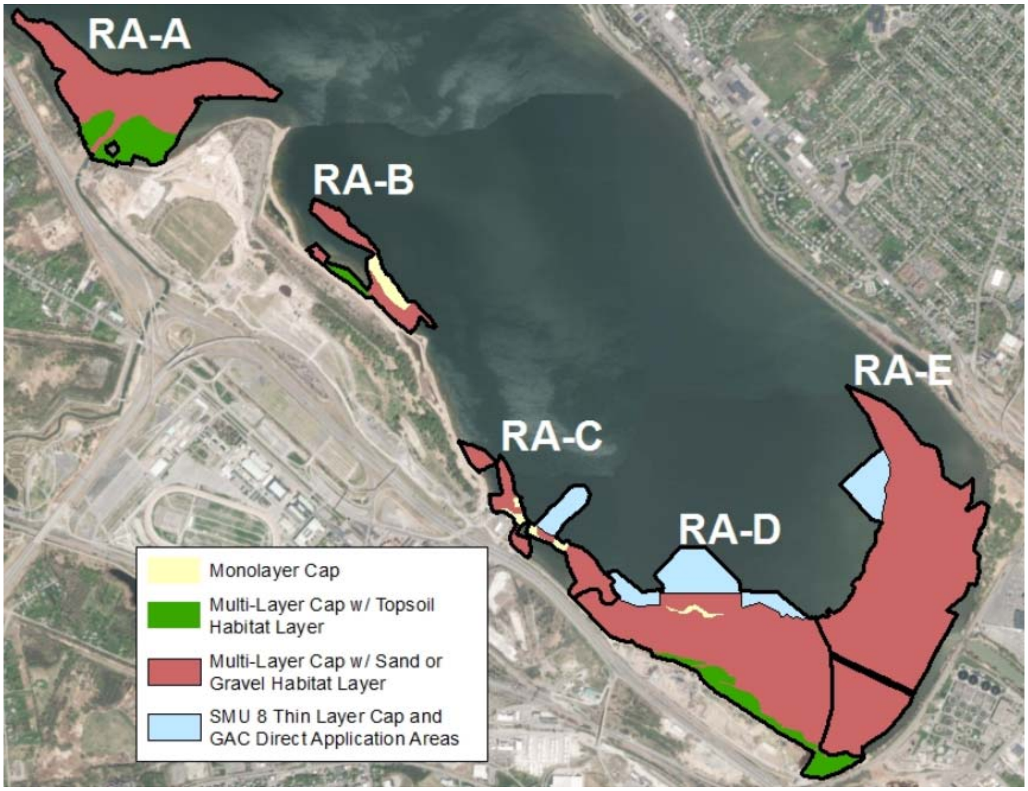
As documented in the draft Onondaga Lake 2017 Monitoring and Maintenance Report (Parsons 2018c), 2017 cap monitoring activities were initiated consistent with the draft OLMMP. Based on 2017 field observations and interim results, several modifications to the comprehensive chemical monitoring program were recommended. These recommendations were subsequently incorporated into the final OLMMP. The 2018 cap chemical monitoring was completed consistent with the final OLMMP. The 2018 modifications from the planned work scope were relatively minor and enhanced the ability to assess the chemical performance of the cap. They consisted of:

- Collection of additional samples to assess the validity of porewater toluene concentrations measured in some of the porewater samples collected in 2018, as detailed below in Section 6.2.2.1.
- Addition of a supporting sample in the chemical isolation layer from 9 to 12 inches (analyses for VOCs, light polycyclic aromatic hydrocarbons (LPAHs) 20 mL, mercury 10 mL), as requested by NYSDEC. This was a sample from an MPC with design minimum thicknesses for the habitat/erosion protection and chemical isolation layers, respectively, of 10 inches and 4.5 inches). The peeper was placed at this station at the location of core C which showed gravel from 0 to 8 inches and sand from 8 to 22 inches. The measured cap thickness significantly exceeded the design minimum and allowed addition of the subject sample interval. In addition, the pH and laboratory pre-screen sample were moved down to 12 to 15 inches.

6.2.2 Littoral Zone Chemical Monitoring Results

The habitat layer chemical-specific performance criteria for the lake, Outboard Area, and WB 1-8 connected wetlands are the PEC for each of the 23 chemicals that have been shown to exhibit acute toxicity on a lake-wide basis, and the NYSDEC sediment screening criteria (SSC) for benzene, toluene, and phenol. The habitat layer chemical-specific performance criteria for the Ninemile Creek spits is consistent with the criteria set forth in the Ninemile Creek OU-2 ROD. There is no evidence of significant chemical migration in any capped areas based on the results of the 2017 and 2018 sampling programs, which included sampling solid phase and porewater from cap material in both the habitat layer and chemical isolation layer. Because of the differing cap designs and/or resultant monitoring strategy, the chemical monitoring results are discussed separately below for the following categories:

- Multi-layer caps with sand or gravel habitat layer (i.e., non-topsoil)
- Mono-layer caps, including direct granular activated carbon (GAC) application areas
- Multi-layer caps with topsoil habitat layer
- pH monitoring results from caps constructed with a sand/siderite layer
- Total organic carbon (TOC) monitoring results



6.2.2.1 Multi-layer Caps with Sand or Gravel Habitat Layer

As documented in the draft Onondaga Lake 2017 Monitoring and Maintenance Report (Parsons 2018c), there was no evidence of significant chemical migration in any of the multi-layer caps with a sand or gravel habitat layer based on the results of the 2017 sampling program. The program included almost 5,000 chemical analyses from 88 sampling locations for multi-layer caps with sand or gravel habitat layer, including both habitat layer (compliance) and chemical isolation layer (additional) sampling. Over 96 percent of the analytical results were non-detects or very low (less than five percent of the performance criteria). There were no exceedances of the cap performance criteria within the habitat layer due to chemical migration from underlying sediments. All detected concentrations are attributable to factors other than chemical migration from the underlying sediment. The 2017 sampling locations are shown in Figures 6.34 through 6.39. The figures included in Appendix 6.H show 2017 concentrations as bars relative to the performance criteria (indicated by horizontal blue lines). Tables in Appendix 6.I summarize the 2017 concentrations measured in the habitat layer of multi-layer caps in non-topsoil cap areas. Detected concentrations were attributable to impacts from background unremediated areas, including tributaries, and impacts from adjacent areas during cap construction, as discussed below.

The cap chemical isolation layer was designed to minimize the migration of chemicals from the sediment beneath the cap to the surface of the cap where benthic organism exposure may occur, and maintain concentrations within the habitat layer below the performance criteria. To evaluate whether caps are functioning as intended, it is important to understand the vertical pattern of chemical concentrations within the cap that would be indicative of chemical transport. If chemical migration from underlying sediments were occurring, chemical concentrations would be highest in the chemical isolation layer (closest to the sediment) and decrease with distance from the sediments (closest to the surface of the cap). Based on observed patterns in chemical concentrations measured in 2017 and consideration of factors that may explain these patterns, it was concluded in the draft 2017 Onondaga Lake Monitoring and Maintenance Report that 2017 detected concentrations were attributable primarily to impacts from background unremediated areas, including tributaries, and impacts from adjacent areas during cap construction. The 2017 comprehensive monitoring results indicated that these multi-layer caps are performing as intended.

No exceedances of cap criteria in the habitat layer were attributable to chemical migration from the underlying chemical isolation layer. However, two samples collected in 2017 from the habitat layer contained phenol concentrations that exceeded the cap criteria, and one 2017 habitat layer sample contained toluene concentrations that exceeded the cap criteria. These exceedances were attributable to factors other than chemical migration. Because phenol is biodegradable, phenol concentrations are anticipated to decrease over time. It is unlikely that exceedances of the cap phenol or toluene criteria would indicate toxicity or risk. As documented in the ROD, neither phenol nor toluene were shown to exhibit acute toxicity on a lake-wide basis. In addition, the cap criterion for phenol is based on the NYSDEC sediment screening criteria derived from surface water criteria based on taste and odor in fish tissue, not aquatic toxicity.

The 2018 sampling results are consistent with those from 2017; there was no evidence of significant chemical migration in any of the multi-layer caps with a sand or gravel habitat layer and these multi-layer caps are performing as intended. The 2018 sampling locations are shown in Figures 6.35 through 6.38. The figures included in Appendix 6.J show 2018 concentrations as bars relative to the performance criteria (indicated by horizontal blue lines). Table 6.2 summarizes the 2018 concentrations measured in the habitat layer of multi-layer caps in non-topsoil cap area. Detailed 2018 analytical data tables are provided in Appendix 6.G.

Although no 2018 exceedances of cap criteria were attributable to chemical migration from the underlying chemical isolation layer, two 2018 habitat layer samples exceeded the cap criteria for toluene, and several other toluene results were higher than expected. It was concluded that these laboratory detections were not a result of migration from underlying sediments based on the following:

- Detected concentrations in RA-E in cap porewater were higher than concentrations detected in underlying sediments during the PDI.
- The concentrations in the bottom cap sample interval were always lower than those measured in the upper intervals, which is contrary to the pattern of maximum concentration at the bottom interval that would be expected if there was migration upward from underlying sediments.

- Based on the PDI, xylenes were present at concentrations similar to those of toluene in underlying sediments and have similar mobility as toluene, yet xylenes were not detected in any 2018 samples.

Based on the above, it was hypothesized that the detected concentrations may have been a result of contamination of the sample during collection and processing or at the laboratory. Therefore, repeat samples were collected from the three sample locations with the highest reported toluene concentrations: RAD-26, RAE-23, and RAE-29. Upon peeper retrieval, porewater samples were taken from every three-inch interval beginning from three inches below the cap surface through the top three inches of the chemical isolation layer. A total of 25 intervals were sampled from the three sample locations. Samples from each interval were submitted to two independent laboratories (ALS Laboratories and SGS Laboratories) for target VOC analysis. Both laboratories reported non-detects for all analytes, including toluene, in all 50 samples submitted. These results contrast significantly from the results from the initial round of sampling in 2018, when toluene was detected in six of nine samples from these locations. Based on the resampling results, the toluene results from the initial round of sampling are highly suspect. It is unlikely they represent actual concentration present in the cap. However, the source of the measured toluene concentrations in the first round of sampling was not identified.

As part of the resampling, an expanded set of QA/QC samples were collected and analyzed to ensure samples were not being inadvertently contaminated during sample collection, processing and analysis. All QA/QC samples were submitted to the two laboratories that analyzed the additional cap samples. The QA/QC samples collected and submitted to each laboratory are as follows:

- Three sets of water samples from a peeper which was prepared and brought onto the peeper retrieval boat, but not installed into the cap
- One set of water samples poured directly from the deionized deoxygenated water container used for peeper preparation
- One set of water samples taken from the deionized deoxygenated water using the same syringes used for peeper sampling
- One set of water samples taken from jars or deionized deoxygenated water which were left open in the peeper processing shed during processing
- Three sets of solid phase samples taken from clean sand placed in core liners and brought out on to the peeper retrieval boat
- One set of solid phase samples taken from clean sand directly from its container

Both laboratories reported non-detects for all analytes in all QA/QC samples submitted.

In addition to toluene, low levels of phenol, benzene and chlorobenzene were detected in some of the 2018 porewater samples, as shown in Table 6.2. The benzene and chlorobenzene detected concentrations were all very low, only slightly higher than the analytical detection limit. Phenol was detected more frequently but still at relatively low levels. The highest concentrations were randomly distributed between the upper and lower sample intervals, which is contrary to the pattern of maximum concentration at the bottom interval that would be expected if there was migration upward from underlying sediments. This indicates that, consistent with the 2017 results, these measured detections are attributable to impacts from background impacts such as unremediated areas and impacts from adjacent areas during cap construction. The cap is functioning as intended.

6.2.2.2 Littoral Zone Monolayer Caps, Including GAC Direct Application Areas

As documented in the draft Onondaga Lake 2017 Monitoring and Maintenance Report, there was no evidence of significant chemical migration in any mono-layer capped area based on the results of the 2017 sampling program. Monolayer caps include the GAC direct application areas. The program included 345 chemical analyses from 20 sampling locations. The 2017 mono-layer cap sampling locations are shown in Figures 6.35 through 6.38. Tables in Appendix 6.I summarize the 2017 concentrations measured in mono-layer caps. Detected concentrations were attributable to impacts from background unremediated areas, including tributaries, as detailed in the draft Onondaga Lake 2017 Monitoring and Maintenance Report. The 2017 comprehensive monolayer cap monitoring results indicate that the monolayer caps are performing as intended. No sampling of mono-layer caps was completed in 2018.

6.2.2.3 Multi-layer Caps with Topsoil Habitat Layer

As documented in the draft Onondaga Lake 2017 Monitoring and Maintenance Report, there was no evidence of significant chemical migration in any multi-layer capped areas with a topsoil habitat layer based on the results of the 2017 sampling program. The 2017 program included over 1,300 chemical analyses from 25 sampling locations. All detects are attributable to causes other than chemical migration from the underlying sediment, including background levels of PAHs present in the topsoil used for construction of the cap, as detailed in the draft Onondaga Lake 2017 Monitoring and Maintenance Report. Tables included in Appendix 6.I present data summaries for the 2017 topsoil monitoring results.

Although no 2017 exceedances of cap criteria were attributable to chemical migration from the underlying chemical isolation layer, there was one minor exceedance of the cap performance criteria for PAHs (benzo(a)pyrene in the 3- to 6-inch interval at sample location A-11) due to background influences. Because it is one isolated sample, this exceedance does not indicate an unacceptable risk to benthic organisms. In addition, a mean PEC quotient (mean PECQ) greater than 1 was used in the ROD to define areas of the lake that posed potential unacceptable risks to benthic organisms based on toxicity considerations. The mean PECQ takes into consideration the concentrations of multiple chemicals, including 16 individual PAHs. The mean PECQ at this location was 0.1.

There were also three 2017 habitat layer samples that exceeded the cap criteria for toluene. These and several other toluene results reported in some of the topsoil samples collected from near the mouth of Ninemile Creek, in the WB-B connected wetland, and in the WB-B/HB Outboard

Area were higher than expected. It was concluded that these laboratory detections were not a result of migration from underlying sediments based on the following:

- Detected concentrations in topsoil at the mouth of Ninemile Creek and in WB-B/HB Outboard Area were significantly higher than concentrations detected in underlying sediments during the PDI.
- The highest concentrations were randomly distributed between the upper and lower sample intervals, which is contrary to the pattern of maximum concentration at the bottom interval that would be expected if there was migration upward from underlying sediments.
- Xylenes are present at significantly higher concentrations than toluene in underlying sediments and have similar mobility as toluene, yet xylenes were not detected in any topsoil samples.

Based on the above, it was hypothesized that the detected concentrations may have been a result of contamination of the sample during collection and processing or at the laboratory. Therefore, repeat samples were collected in April 2018 from the four locations with the highest toluene concentrations (A-14, A16, B-6 and D-44), which included the three samples that exceeded the toluene criteria. Toluene results from 2018 were significantly lower than the 2017 results at all four resampled locations, and none exceeded the toluene criteria. However, at multiple locations, the toluene concentrations from the 2018 sampling were still higher than expected, and in some cases exceeded underlying sediment toluene concentrations measured during the PDI. Therefore, it was concluded that the toluene measured in 2017 was not due to contamination of the samples during collection, processing, or analysis.

Based on available evidence, as detailed in the bulleted list above, the toluene concentrations measured in the topsoil are not a result of migration from underlying sediments. The source of toluene at these locations is not known, but the toluene may have been introduced to the topsoil prior to or during construction. These elevated levels do not indicate an unacceptable risk to benthic organisms given their infrequent and sporadic occurrence. As documented in the ROD, toluene was not shown to exhibit acute toxicity on a lake-wide basis, and therefore was not included in the list of chemicals used to develop the mean PECQ. A mean PECQ greater than 1, which takes into consideration the concentrations of multiple chemicals, was used in the ROD to define areas of the lake that pose potential unacceptable risks to benthic organisms based on toxicity considerations. Furthermore, because toluene is biodegradable, toluene concentrations are anticipated to decrease over time.

Monitored topsoil areas in 2017 include the Ninemile Creek spits, which are part of the Ninemile Creek site. The chemical-specific performance criteria for the Ninemile Creek spits is consistent with the floodplain criteria set forth in the Ninemile Creek OU-2 ROD, which is 0.6 mg/kg of total mercury on a surface weighted average basis. Two sample locations within the spits (A-17 and A-18) each included two sample intervals. Mercury concentrations in both samples were in compliance with the Ninemile Creek mercury criteria.

No samples were collected in 2018 from multi-layer capped areas with a topsoil habitat layer other than the repeat sampling of prior cores with elevated toluene discussed above.

6.2.2.4 Total Organic Carbon

Consistent with the Work Plan, 2017 solid-phase samples that did not contain GAC were analyzed for TOC. The performance criteria for chemicals that are included in the calculation of the mean PECQ are based on cap solid phase concentrations, whereas the performance criteria for chemicals based on the NYSDEC sediment screening criteria (i.e., benzene, toluene, and phenol) are based on cap porewater concentrations. TOC values are needed to convert solid phase benzene, toluene and phenol sample concentrations to porewater concentrations for comparison to the cap criteria in cases where solid phase (as opposed to porewater) cap samples were collected. For chemicals that are included in the calculation of the mean PECQ, porewater concentrations must be converted to solid phase concentrations for comparison to the cap criteria. For samples in which TOC was measured, the sample-specific TOC was used for the conversion. For samples in which TOC was not measured (i.e., where the cap material consisted of gravel or cobble, or sand mixed with GAC), the average TOC concentrations measured from a similar depth interval within the cap from samples collected throughout the RA were used for the conversion. No solid phase samples were collected in 2018. Therefore, the 2017 TOC values were used for all 2017 and 2018 conversions. The 2017 TOC values are included in Appendix 6.I.

6.2.2.5 pH

The caps in areas that include siderite as an amendment were designed to maintain a pH less than 8 within the chemical isolation and habitat/erosion protection layers for 1,000 years to promote biodegradation of organic chemicals. The 2017 pH monitoring results are included in Appendix 6.I. The pH was below 8 or just marginally above 8 for most samples collected in 2017. As shown in Table 6.3 and the pH profiles included in Appendix 6.K, 2018 pH monitoring results were similar to those from 2017. The pH was below 8 or just marginally above 8 for most 2018 samples. Short-term exceedances of the pH goal were expected as a result of porewater expression due to consolidation of underlying sediments (as described in Appendix I of the final design), and the measured values do not indicate compromised cap performance. These impacts are expected to be relatively minor and of short duration. The slightly elevated pH, including values greater than 8, in some near-surface samples may be a result of interactions with lake surface water, which is naturally alkaline and often has a pH above 8. Based on UFI's 2017 monitoring of lake water (April 6 through November 26) at the south buoy, the pH ranged from 7.5 to 8.4, and averaged 8.0 in water depths from 1 meter to 6 meters.

6.2.3 SMU 8 Thin-Layer Caps and Direct GAC Application Areas

Thirty-eight samples were collected, and over 950 analyses were performed from 25 SMU 8 thin-layer cap and direct GAC application area locations in 2017. The long-term performance criteria for amended and un-amended thin layer cap (TLC) and direct GAC application areas in SMU 8 is to meet the mean PECQ criterion of 1 and mercury PEC criterion of 2.2 mg/kg within the top 4 cm (approximately two inches), which is the compliance depth for SMU 8. Samples were collected from the top 4 cm of the sediment at each of the 25 sample locations for the purposes of assessing cap performance. A sample was also collected from the depth interval of 4 to 10 cm in un-amended TLCs for potential future consideration if it is determined that the compliance depth should extend deeper than 4 cm. The 2017 monitoring results are included in Appendix 6.I. All samples collected from the SMU 8 TLC and direct GAC application areas in 2017 were significantly below the performance criteria. Concentrations are anticipated to decrease to even lower levels over time as clean sediments accumulate in SMU 8. No samples were collected in 2018 from SMU 8 thin-layer caps or GAC direct application areas.

6.2.4 Summary of 2017 and 2018 Chemical Monitoring Results and Recommendations for 2019 Monitoring

The combined 2017 and 2018 chemical monitoring programs included over 8,200 chemical analyses from 165 sampling locations, including multi-layer and monolayer isolation caps in the littoral zone and thin layer capping and direct application areas in SMU 8. Over 90 percent of the analytical results were non-detects or very low concentrations (less than five percent of the performance criteria). Detected concentrations were primarily attributable to background influences, as detailed in the sections above. There were no exceedances of the cap performance criteria within the habitat layer due to chemical migration from underlying sediments. The monitoring results detailed in the preceding sections are summarized below.

Cap Type	Number of Sample Locations	Number of Samples	Number of Analyses	Number of Exceedances	Number of Exceedances due to Chemical Migration
Multi-Layer	120	441	6961	9	0
Monolayer	20	46	345	0	0
SMU 8 TLC	25	38	950	0	0

Although there were no 2017 or 2018 exceedances of cap criteria attributable to chemical migration from the underlying chemical isolation layer, there were nine exceedances of the cap performance criteria in multi-layer caps due to other factors such as background impacts, as detailed in the sections above and in the draft Onondaga Lake 2017 Monitoring and Maintenance Report. The infrequent exceedances of the cap criteria do not indicate an unacceptable risk to benthic organisms or other potential receptors given their infrequent and sporadic occurrence. Five of the sample locations with exceedances, all for toluene, were subsequently resampled. None of the results from the resampling exceeded the cap criteria. Of the remaining exceedances, one was for toluene, one was for benzo(a)pyrene, and two were for phenol. As documented in the ROD, neither toluene nor phenol was shown to exhibit acute toxicity on a lake-wide basis. Therefore, these chemicals were not included in the list of chemicals used to develop the mean PECQ. A mean PECQ greater than 1, which takes into consideration the concentrations of multiple chemicals, was used in the ROD to define areas of the lake that pose potential unacceptable risks to benthic organisms based on toxicity considerations. There were no exceedances of the mean PECQ. Furthermore, all the exceedances were for contaminants that are biodegradable and are anticipated to decrease over time. Results from the 2017 and 2018 chemical monitoring programs verify that there is no evidence of significant chemical migration through any of the multi-layer or monolayer capped areas and the cap remains protective of human health and the environment. All 2017 and 2018 sample locations will be resampled in 2019.

The 2019 chemical monitoring locations are shown in Figures 6.40 through 6.45. This monitoring incorporates recommended modifications to the 2019 chemical monitoring program specified in the OLMMP consisting of:

- Consistent with recommendations in the draft Onondaga Lake 2017 Monitoring and Maintenance report, comprehensive rather than focused chemical monitoring of the cap will be completed in 2019.
- Porewater from peeper locations A-8 and A-9 will be sampled from the intervals shown in Figure 6.46, which has been corrected from Figure D.19 from Appendix D of the OLMMP to accurately reflect that the habitat layer at these locations is a minimum of 18 inches rather than 12 inches.
- New peeper locations A-30 and A-31, as shown in Figure 6.40, will be sampled per the schematic included in Figure 6.46. These peeper locations were added per NYSDEC's request to enhance the cap monitoring adjacent to the WB 1-8 north shore hydraulic containment system.

6.3 CSX SHORELINE

A dredging and capping offset was developed in RA-E in the vicinity of the active rail lines along the southeastern shoreline based on rail line stability considerations. This offset ranges from approximately 130 to 200 ft. from the shoreline and impacts an area of approximately 10.1 acres. As specified in the Design Addendum for this area (Parsons and Anchor QEA 2014), the remedial program for the offset area includes baseline surface sediment sampling at approximately the same density as sampled during the PDI for the full list of mean PECQ parameters plus benzene, toluene and phenol; total organic carbon (TOC); grain size; and post-remedy surface sediment sampling at/near baseline locations to confirm natural recovery.

Baseline sampling in this area was completed in fall 2016. Sampling details and results are provided in the Summary Report Onondaga Lake 2016 Cap Monitoring (Parsons and Anchor QEA 2018d). As specified in the OLMMP, post-remedy sampling events and bathymetric surveys will be completed in this area in 2019 and 2024 prior to the second and third USEPA Five-Year Reviews. The need for scope and timing for subsequent monitoring in this area will be determined based on the results of the 2024 sampling event.

6.4 SHORELINE HYDRAULIC CONTROL SYSTEM OPERATION

As part of the Interim Remedial Measures (IRMs) associated with adjacent contaminated sites, shoreline subsurface barrier walls and/or groundwater collection systems have been installed directly adjacent to several capped areas within the lake and adjacent wetlands. Successful hydraulic containment by these systems limits groundwater upwelling in adjacent lake and wetland areas. It is therefore an important factor in ensuring the caps achieve their established performance criteria. Groundwater flows through three zones in the aquifer: shallow, intermediate, and deep. A clay layer separates the intermediate and deep zones. Operational and monitoring data from the hydraulic containment systems are used to demonstrate that groundwater from the shallow and intermediate zones is being successfully captured. Thus, the only potential source of groundwater upwelling through the cap is from the deep zone through the underlying clay layer. This was the design basis used to generate the groundwater upwelling rates for cap modeling for the final design. Hydraulic containment systems include:

- Shoreline groundwater collection system that has been implemented as part of the WBs 1-8 IRM
- Shoreline barrier walls and groundwater collection systems that have been implemented as part of the Willis/Semet and WB B IRMs

Infiltration of impacted groundwater to Onondaga Lake along the southeastern shoreline has been mitigated as part of the Willis/Semet and WB-B IRMs through construction of a control system that includes a sheet pile barrier wall and a groundwater collection system. The hydraulic barrier wall is the primary groundwater control mechanism and extends a minimum of 3 ft. into the clay layer present at depths ranging from 35 to 70 ft. below grade. As documented in Honeywell Lakeshore Upland Sites Performance Verification 2017 Annual Report (Parsons and O'Brien and Gere 2018), the ability to contain groundwater and in general maintain an inward hydraulic gradient has been demonstrated for these systems and is expected to continue in perpetuity. Successful operation of the system is ongoing, including preparation of the 2018 annual report to be submitted to NYSDEC.

The WB 1-8 IRM includes the Eastern and Remediation Area A shoreline groundwater collection systems to control shallow and intermediate groundwater discharges to Onondaga Lake. As documented in *2015 and 2016 Source Control Summary for the Onondaga Lake Bottom Subsite* (Parsons and OBG 2016), data through the end of March 2016 indicated general achievement of hydraulic control for these systems, with periodic exceptions during scheduled maintenance, extreme weather conditions, and elevated lake levels. Since then, numerous system upgrades and optimization activities have been implemented which have resulted in improved system performance. NYSDEC has been updated regularly via weekly reports on the performance of and upgrades to these systems. Demonstration of consistent performance has been challenging along a portion of the system that is directly adjacent to the capped area in RA-A. Therefore, at NYSDEC's request, peeper locations A-30 and A-31 (Figure 6.40) have been added to the 2019 cap monitoring program to verify that the cap adjacent to this portion of the hydraulic containment system remains protective. Monitoring of upwelling velocities in the capped area adjacent to the hydraulic containment system is also under consideration and would be implemented as part of the WB 1-8 monitoring program.

6.5 INSTITUTIONAL CONTROLS

As specified in the OLMMP, institutional controls are included as part of the long-term monitoring and maintenance program for the lake to protect the integrity of the cap and ensure long-term protectiveness of human health and the environment. Specifically, institutional controls have been implemented to:

- Prevent unacceptable exposure to residual contamination within the lake
- Prevent recreational boaters from accidently hitting any navigational hazards created by capping and restoration components of the remedy
- Prevent damage to the cap from activities such as navigational dredging

The specific institutional controls detailed in the OLMMP and the status of these institutional controls is detailed below.

- NYSDOH fish consumption advisories. These advisories remain in place and are consistent with those listed in the OLMMP. In 2017, the City of Syracuse and Onondaga County posted signs in numerous locations along the shore of Onondaga Lake regarding the presence of consumption advisories and where to find additional information. Honeywell is not aware of any public outreach activities relating to fish consumption advisories since the finalization of the OLMMP.
- NYSDEC and USACE[5] permitting process to restrict actions that may disrupt the cap or SMU 8 sediment. This permitting process remains in place, and there have been no activities that Honeywell is aware of that have disrupted the cap or SMU 8 sediment. Honeywell is currently working with the NYSDEC to finalize the Onondaga Lake Site Management Plan, which will provide additional details regarding institutional controls that will be implemented to prevent actions that may disrupt the cap or SMU 8 sediment.
- Recreational boating buoys. The New York State Office of Parks, Recreation and Historic Preservation maintains navigational buoys in Onondaga Lake to warn boaters of hazards in water less than 4 ft. deep and beyond 100 ft. from shore. This includes buoys associated with shallow water resulting from capping activities in a small portion of RA-A, which have been deployed annually since 2016.
- Navigational charts. Updated (post-capping) bathymetric survey results were provided in May 2017 to the National Oceanic and Atmospheric Administration (NOAA) to allow them to update the Navigational Chart for Onondaga Lake (currently included as Chart Number 14786 page 33 for the Small-Craft Book Chart for the New York State Canal System).

[5] USACE- U.S. Army Corps of Engineers

SECTION 7

SHORELINE STABILIZATION

7.1 SUMMARY OF 2017 MONITORING ACTIVITES AND RECOMMENDATIONS

The WB 1-8 shoreline stabilization consisted of placement of a layer of gravel over the existing substrate to stabilize near-shore sediments. The measure was implemented as part of the Onondaga Lake remedy to reduce wind-driven turbidity resulting in resuspension of sediment from the WB 1-8 shoreline. UFI collected pre-stabilization turbidity measurements from late August to late November at three stations in 2012 in accordance with a NYSDEC-approved work plan.

UFI collected post-stabilization turbidity measurements from late August through November 2017 consistent with the OLMMP (Parsons 2018b), as approved by NYSDEC. Three data sondes, which were either affixed to stakes driven into the lake bottom (Stations 1 and 2) or suspended from a buoy (Station 3), were deployed in Onondaga Lake adjacent to the shoreline of WB 1-8 near the three stations used in 2012. The sondes were used to collect turbidity, specific conductance and temperature measurements every 15 minutes continuously from August 30 to November 30, 2017 (Figure 7.1). Data from robotic monitoring buoy at the South Deep station provided background near-surface turbidity levels as well as wind speed and direction.

Data were compared to the pre-stabilization turbidity measurements to verify the turbidity reduction resulting from shoreline stabilization per the criteria presented in the OLMMP. A summary of the mean turbidity results for 2017 compared with those observed in 2012 is presented in Table 7.1. High frequency turbidity measurements made during the September to November interval of 2012 and 2017 indicate that the reductions in wind-driven resuspension of nearshore sediments occurred following stabilization of the WB 1-8 shoreline. Therefore, as per the OLMMP, further turbidity monitoring is not warranted, as detailed in full in the draft 2017 Annual Report (Parsons 2018a).

An annual physical inspection of this area will be conducted as part of the long-term cap physical monitoring program, as detailed in Appendix D of the OLMMP. Any signs of potential erosion will be photographed and noted during the inspection. Any other signs of potential impacts, such as seeps or disturbances, will also be noted. Physical inspections will occur annually for a minimum of five years. Additional physical monitoring may be appropriate based on the results of the first five years of monitoring. Future turbidity monitoring may be appropriate based on the results of the annual visual inspections. Additional turbidity monitoring, if required, will be completed at the closest downwind location monitored during baseline monitoring should significant material losses be observed during physical monitoring to verify that turbidity remains lower than baseline levels. The scope of this additional turbidity monitoring, if needed would be developed in consultation with and subject to approval by NYSDEC.

SECTION 8

2018 NITRATE ADDITION

8.1 INTRODUCTION

8.1.1 Purpose and Background

This report describes the activities during and results from the fifth year of full-scale nitrate addition conducted on behalf of Honeywell. Nitrate is being added to maintain nitrate concentrations in the hypolimnion of Onondaga Lake sufficient to mitigate the release and/or production of methylmercury from low levels of mercury in the lake's profundal zone (i.e., deep water) sediment (Parsons and Upstate Freshwater Institute [UFI], 2014b). Methylmercury is a substance that bioaccumulates in aquatic organisms and can make fish unsuitable for human consumption.

The remedy for the Onondaga Lake bottom is described in a ROD prepared by the NYSDEC and the USEPA (2005). In 2014, following completion of the three-year nitrate addition pilot test, NYSDEC and USEPA issued an Explanation of Significant Differences that specified continuation of nitrate addition to the hypolimnion of Onondaga Lake as warranted during summer and early fall (NYSDEC and USEPA 2014).

As Onondaga Lake surface water temperatures increase during spring and early summer months, the water column thermally stratifies so the warmer, less dense waters of the epilimnion overlie the colder, denser waters of the hypolimnion. The epilimnion and hypolimnion are separated at a water depth of approximately 30 ft. (9 meters) by the thermocline, which greatly limits transport between these layers. The hypolimnion is subject to depletion of dissolved oxygen followed by depletion of dissolved nitrate during the stratification period, which typically extends from mid-May through mid-to-late October. When concentrations of oxygen and nitrate are low, profundal sediments may release methylmercury to the water column. Methylmercury, if present in the profundal zone of the lake, can be transported to the upper waters primarily when lake waters mix in the fall at a time known as fall turnover. During summer periods in years prior to the nitrate addition pilot test, depletion of nitrate in lower waters resulted in higher methylmercury concentrations in those waters.

During 2007 and 2008, releases of methylmercury to the hypolimnion were found to be substantially lower than in prior years due primarily to elevated nitrate concentrations in the lake. The increase in nitrate was a consequence of wastewater treatment upgrades implemented at the Onondaga County Metropolitan Syracuse Wastewater Treatment Plant (Metro) located along the southern (upstream) shore of Onondaga Lake. Wastewater treated at Metro is discharged into the nearshore waters of the lake. In 2004, Onondaga County began operating a biologically-active filter system at Metro that converts ammonia in wastewater to nitrate. As a result, the available pool of nitrate in the hypolimnion at the start of summer stratification almost doubled. In 2005, Onondaga County implemented an advanced phosphorous-removal system that resulted in decreased algal growth in the upper waters of the lake and reduced demand for oxygen and nitrate in the hypolimnion. Because of Metro's additional wastewater treatment efforts, nitrate persisted in the Onondaga Lake hypolimnion for a significantly greater time during summer months of 2007 and 2008, which inhibited the release of methylmercury from SMU 8 sediments (UFI and Syracuse University (SU), 2007; Todorova et al., 2009). The nitrate addition pilot test was conducted successfully for three years from 2011 through 2013, and the full-scale nitrate addition was conducted from 2014 to present, which has further inhibited the release of methylmercury from profundal zone sediments. A summary of the full-scale application program is provided below.

8.1.2 Operation and Monitoring

During 2018, as during previous years, liquid calcium nitrate solution was diluted with upper lake waters and added directly to the lower waters in the profundal zone at three locations in the lake. One application location was in the northern basin of Onondaga Lake, and the other two were in the southern basin of the lake (Figure 8.1). The three application locations used in 2018 were the same locations at which nitrate was applied from 2011 through 2017.

In 2018, nitrate was added to the lower, stratified waters of Onondaga Lake in 59 non-consecutive, single-day applications from June 12 through October 16 (see Table 8.1). A target one-day dose of liquid calcium nitrate solution[6] was applied at one of the three application locations during each application day.

As noted in the Operations and Monitoring (O&M) Plan (Parsons and UFI 2014b), extreme events such as the lack of spring turnover or the Metro treatment facility going offline could affect the amount of nitrate in the lake. The nitrification treatment at Metro was offline for some time during the winter and spring of 2018. To offset this, the nitrate application system was effectively implemented earlier in the year and more frequently during the season to meet program objectives.

Monitoring of lake conditions during 2018 provided the basis for assessing lake conditions directly and indirectly associated with nitrate addition. Three-dimensional monitoring of nitrate concentrations in the lake's profundal zone was completed twice per week during the nitrate addition period. Thirty-four locations were monitored each week, and a subset of 10 or 11 of those locations were monitored later in the week. In addition, surface water samples were collected at the South Deep location (Figure 8.2) on 23 different dates from May 16 to November 19, 2018, and analyzed for methylmercury and other parameters to confirm the effectiveness of adding nitrate.

[6] The liquid calcium nitrate used was labeled CN-8 by the supplier Univar of Bedford, Illinois.

Fall turnover, which marks the end of summer stratification, typically takes place between mid-October and early November in Onondaga Lake, depending on complex lake mixing and meteorological factors. In 2018, fall turnover of Onondaga Lake occurred on October 25th.

Nitrate addition O&M was performed in 2018 in accordance with the approved O&M Plan (Parsons and UFI 2014b).

8.1.3 Reporting

Section 8.2 describes the 2018 field activities and identifies any deviations from the work plan. Section 8.2 also presents monitoring data and discusses the results. Section 8.3 summarizes results and provides recommendations for revisions to the application or monitoring program. Appendix 8A presents an example of daily monitoring information provided on the same day field data were collected. Appendix 8B summarizes nitrate concentrations observed one meter above the lake bottom. Appendix 8C is the DUSR for relevant laboratory water quality data compiled in 2018. Appendix 8D presents depth profile plots of dissolved oxygen, nitrate-nitrogen (NO_3-N), manganese, total mercury, and methylmercury water concentrations. Appendix 8E presents total dissolved gas data for 2018.

8.2 PRESENTATION OF MONITORING DATA AND DISCUSSION OF RESULTS

8.2.1 Mobilization, Monitoring and observations

Nitrate is added to maintain summertime nitrate-nitrogen levels in the lower hypolimnion (below the 14-meter water depth) at or above 1.0 mg/L, thereby limiting accumulations of methylmercury in hypolimnion waters. This section describes:

- Natural development of thermal stratification
- In-lake monitoring program
- Dissolved oxygen and nitrate resources of the hypolimnion
- Effect of nitrate applications on nitrate levels
- Nitrite concentrations in lake water
- Mercury concentrations in lake water
- Other related monitoring from June through October 2018 when nitrate was being applied

The 2018 lake water quality monitoring for mercury at the South Deep location began on May 16 and continued through November 19 (Table 8.2). Measurements of dissolved oxygen, nitrate and other water quality parameters in the deep portion of Onondaga Lake prior to the first application provided the information needed to determine when to start adding nitrate to the lake. Water quality measurements during the nitrate application period helped to guide how much nitrate to apply at each location. Water quality monitoring was also conducted on November 7 and November 19, 2018, following the last application of nitrate in 2018.

The 2018 barge equipment, piping, and instrumentation, onshore support area for storage of nitrate, and instrumentation on the UFI monitoring boats included the same elements as previous years (see Figures 2 through 4 in Parsons and UFI, 2014a). Delivery equipment used in 2018 was similar to previous years and was once again set up to maintain a contained, continuous flow from the on-barge equipment to the target application depth.

8.2.2 Application Summary

Nitrate additions were completed in 2018 at the three predetermined locations in the lake used since 2011 (Figure 8.1). The three locations where nitrate was applied are referred to as North, South Location #1 (hereafter called South1), and South Location #2 (hereafter called South2). The desired minimum concentration of nitrate-nitrogen to be maintained in the lake (1.0 mg/L) was identified based on frequent water quality monitoring of methylmercury and nitrate in the profundal zone of Onondaga Lake since 2006 and a historical review of methylmercury releases from Onondaga Lake profundal zone sediments. These releases were described in the approved O&M Plan for adding nitrate (Parsons and UFI, 2014b).

Thermal stratification became strongly established by mid-May 2018, limiting further significant inputs of oxygen and nitrate from the epilimnion downward to the hypolimnion (below the 30-foot water depth in Onondaga Lake). Stratification initiates an annual period of oxygen and nitrate depletion and locks in place the “ambient” oxygen and nitrate pools or supplies. Therefore, nitrate addition was initiated in June 2018 before hypolimnetic nitrate-nitrogen concentrations could fall below 1.0 mg/L at the 18-meter water depth and continued until approximately one week prior to fall turnover. The depth of the thermocline between the epilimnion and hypolimnion was relatively stable through July and August and then descended through September and more rapidly during October until the water column became effectively mixed in the vertical dimension. In 2018, this occurred on October 25.

As in prior years, each application of nitrate in 2018 involved moving and anchoring the barge at the designated application location. A concrete block anchoring system at each application location held the barge stationary for the duration of an application. Inflow and outflow piping with end-of-pipe diffusers were positioned within the lake water column at their target depths. The barge pumps provided water from the epilimnion that was mixed on the barge with full-strength liquid calcium nitrate. The liquid calcium nitrate has a density of approximately 1.47 times the density of lake water. The extent of diluting nitrate with water from the epilimnion was guided during each application by in-lake monitoring. The resulting neutrally buoyant nitrate-water mixture was directed to the lower waters in the lake hypolimnion via hoses and diffusers.

In 2018, nitrate was applied continuously at one of the three pre-determined locations for approximately three to six and a half hours during each application day. The duration of each application depended on how much nitrate was to be added that day to meet the anticipated nitrate demand in that portion of the lake and the extent of dilution needed to keep the nitrate near but above the lake bottom (i.e., increased dilution meant longer pumping times to apply the same volume of nitrate). A total of 59 applications of nitrate were completed during 2018, including 20 applications at the North location, 23 applications at South1, and 16 applications at South2.

Nine of the 59 applications were partial doses due to unsafe weather conditions or the approach of sunset.

Tables 8.1 and 8.2 summarize work completed as part of each 2018 nitrate application. In general, applications were conducted two to three days each week, moving from location to location as directed by results from in-lake monitoring. The pace of applications were slightly accelerated during July and August to keep pace with increased demand for nitrate in the hypolimnion. Table 8.2 provides 2018 operational information, including application location, target dilution factor, lake water temperature and specific conductivity data, nitrate and dilution water flow rates, application durations, and the total amount of nitrate applied during each application. A total of 104.5 metric tons (MT) of nitrate-nitrogen were added to the lower waters of Onondaga Lake during 2018, the largest addition since the program began in 2011. The need for increased application of nitrate in 2018 was foreseen due to the planned shutdown of tertiary wastewater treatment at Metro from October 2017 to March 2018 to implement upgrades.

8.2.3 In-Lake Monitoring

Table 8.3 summarizes the in-lake monitoring completed by UFI in 2018, including both field measurements and sample collection. Figure 8.2 illustrates the 2018 lake monitoring locations. The primary objective of in-lake monitoring was to observe and characterize the vertical and horizontal distribution of nitrate in the lake. Using a submersible ultraviolet nitrate analyzer (SUNA) deployed from a boat, UFI provided near real-time feedback on nitrate conditions. The SUNA was used to take measurements of water depth, nitrate-nitrogen, sulfide, temperature, specific conductivity, turbidity and parameters associated with light penetration and primary productivity. Measurements were collected every 0.25 meter vertically throughout the water column at 34 locations. These data were downloaded and processed, and a summary of the lake nitrate concentrations was provided the same day. Each data summary included nitrate-nitrogen profiles at each monitoring location and bubble plots illustrating nitrate-nitrogen concentrations at particular depths within the hypolimnion. These included one plot of all measurements taken one meter above the lake bottom across the footprint of the hypolimnion. The SUNA was also used to identify the effective water depth where the nitrate was applied. This information was communicated to barge operation in real-time to facilitate adjustments to the density of the nitrate solution.

The performance of SUNA and an equivalent instrument (*in situ* ultraviolet spectrophotometer [ISUS]) have been compared with laboratory measurements of nitrate since 2006. Results from 2018 continue to demonstrate that the SUNA nitrate measurements are comparable to laboratory measurements. The nitrate sensor was checked in distilled water routinely and was recalibrated or replaced when measurements fell outside acceptable limits (±0.028 milligrams of nitrate per liter).

In addition to monitoring during each nitrate application, surface water samples were collected at South Deep on 23 days from May 16 to November 19, 2018 (Table 8.3) and analyzed for various water quality parameters including total mercury and methylmercury. This was consistent with lake water monitoring efforts completed since 2008. Selected surface water samples from the

2-meter and 16-meter water depths were also analyzed for filtered (i.e., dissolved) total mercury. Surface water samples were collected weekly at South Deep from June 26 through October 24, 2018. Collected surface water samples were analyzed for total mercury, methylmercury, and forms of nitrogen (i.e., nitrate, nitrite and ammonia). Samples collected from mid-June to mid-October in waters 14 meters and deeper were also analyzed for soluble reactive phosphorus. Fixed-frequency monitoring focused on sample collection at the South Deep location because water quality at the South Deep location has been determined to be generally representative of water quality conditions throughout Onondaga Lake.

8.2.4 Dissolved Oxygen and Nitrate Observations

Figures 8.3 and 8.4 present dissolved oxygen and nitrate-nitrogen concentrations at the South Deep location for four different water depths from April through November 2018. Figure 8.5 illustrates the depletion of the dissolved oxygen pool at the onset of stratification from May to mid-July 2018, based on measurements from the UFI robotic buoy at the South Deep location. Most of the oxygen available in the hypolimnion during 2018 prior to lake stratification was consumed by the end of June.

Nitrate applications were successful again in 2018 in keeping the nitrate-nitrogen levels in the hypolimnion above 1.0 mg/L throughout the summer months in deeper portions of Onondaga Lake (Figure 8.4). Nitrate-nitrogen levels dropped slightly below 1.0 mg/L in shallower regions of the hypolimnion (10 to 14 meters) during September and early October. The cumulative mass of nitrate-nitrogen applied in 2018 to the lower hypolimnion was 104.5 MT. The mass of nitrate-nitrogen in the hypolimnion prior to the start of stratification in early April 2018 was approximately 50 MT, compared to 80 MT in 2017. Treated municipal wastewater from Metro is the primary input of nitrate-nitrogen to the lake. Metro's tertiary treatment system was shut down from October 2017 to March 2018, resulting in much lower nitrate concentrations in the plant effluent and in the lake. A dry spring in the Onondaga Lake watershed translates to less dilution of Metro effluent resulting in higher nitrate concentrations in the lake. Metro effluent contains an average of approximately 12.0 mg/L of nitrate-nitrogen. Since the density of the Metro effluent is similar to the density of the upper waters of Onondaga Lake, the Metro discharge typically enters the epilimnion or upper metalimnion, rather than the hypolimnion, during summer stratification.

Figure 8.6 presents volume-weighted average nitrate concentrations and mass in the hypolimnion before, during, and following nitrate addition in 2018. The blue line in Figure 8.6 is the volume-weighted nitrate concentration in the hypolimnion, while the purple line represents the mass of nitrogen in the hypolimnion. In general, the average rate of nitrate addition in 2018 was 0.83 MT of nitrate-nitrogen per day (5.8 MT per week) throughout the application season. Figure 8.6 also illustrates the hypolimnion's response to applications of nitrate, with the rate of nitrate depletion slowing when applications of nitrate were ongoing. Nitrate applications began on June 12 at a steady pace through August and September, then slightly decreased in October to maintain target levels. Applications were stopped for the year after October 16 in anticipation of fall turnover.

Figure 8.7 illustrates apparent 2018 nitrate depletion rates in the hypolimnion of Onondaga Lake represented by measurements in the South Basin and North Basin made prior to the initiation of nitrate addition on June 12. Nitrate depletion in the South Basin and North basin averaged 0.0070 mg/L and 0.0053 mg/L of nitrate-nitrogen per day, respectively. Nitrate concentrations in the hypolimnion increased from mid-June to early July and gradually decreased through the end of September, despite continued nitrate applications. In general, nitrate depletion rates are typically higher when concentrations of nitrate in the hypolimnion are higher.

Table 8.4 presents annual lake conditions and observations for 2011 through 2018 that are important factors associated with adding nitrate. Spring turnover nitrate is the concentration of nitrate in lake waters as the waters begin to stratify, which typically takes place during April-May each year. The 2018 spring turnover nitrate concentration was substantially lower than any of the previous years due to the shutdown of nitrification treatment at Metro from October 2017 to March 2018.

Figure 8.8 presents the spatiotemporal distribution of nitrate concentrations in the hypolimnion from early April through mid-November 2018. Areas of the lake with water depths between 14 and 16 meters (46-52 ft.) were generally exposed to nitrate-nitrogen concentrations between 1.0 and 2.0 mg/L for most of the mid-June to early October period when nitrate was being applied. Sediments below the 16-meter (52-foot) water depth were generally exposed to nitrate concentrations greater than 2.0 mg/L during the nitrate application period.

Figure 8.9 illustrates the spatial and temporal extent of the measured nitrate-nitrogen concentrations in 2018 at water depths one meter (3 ft.) above profundal zone sediments. Concentrations of nitrate-nitrogen above the lake bottom generally ranged from 1.0 to 3.0 mg/L throughout the 2018 nitrate application period, meeting the goal of the program. Nitrate concentrations slightly below 1 mg/L were measured near the lake bottom at the shallower sites (e.g., 10 to 13 meters).

8.2.5 Dilution and Dispersion of Applied Nitrate

The specific gravity of the liquid calcium nitrate was 1.47 in 2018. Therefore, significant dilution was required to produce a neutrally-buoyant water-nitrate mixture to take advantage of natural hydrodynamic forces that spread the nitrate around the lower depths of the lake. Once lake monitoring efforts identified an appropriate dilution factor for an application of nitrate, the same dilution factor was used as a starting point for the next application. Further minor adjustments to dilution and pump rates were made based on real-time lake monitoring to achieve a neutrally buoyant plume at the target depth. Figure 8.10 illustrates epilimnion (dilution water) and hypolimnion water temperatures and dilution factors for the 2018 application period.

During summer 2018, dispersion by natural hydrodynamic forces was again sufficient to distribute nitrate horizontally across the hypolimnion from the three application locations. Appendix 8A provides an example of the daily SUNA data reports produced and issued by UFI to verify the application and distribution of the applied nitrate. Appendix 8B presents bubble plots prepared by UFI illustrating conditions across the hypolimnion at a distance of one meter (3 ft.) above the lake bottom. The target nitrate-nitrogen concentration of 1.0 mg/L continued to be met in lower hypolimnion waters throughout the 2018 season, and minimal concentrations of methylmercury were observed in the lower waters.

Applications of nitrate were terminated for 2018 after October 16, based on an assessment of the size of the remaining nitrate pool in the hypolimnion and anticipated uptake of nitrate in lower waters of the lake through an estimated late turnover timeframe of early November. Approximately 56 MT of nitrate-nitrogen remained in the lake's hypolimnion on October 16, 2018 (Figure 8.6).

The lowest measurement of nitrate-nitrogen observed in the hypolimnion in 2018 was 0.26 mg/L (measured by SUNA), which occurred on September 28 at a water depth of 11 meters. At the time of the next monitoring on October 1, the nitrate concentration at this depth increased to 1.1 mg/L.

8.2.6 Significance of 2018 Nitrite Water Concentrations

Nitrite-nitrogen (NO_2-N) concentrations measured in Onondaga Lake from 2006 through 2018 have been compared to the New York State SWQS established to protect warm water fish from effects of nitrite (Figure 8.11). The SWQS for nitrite (100 micrograms per liter [µg/L] as nitrogen) was exceeded at the 2-meter depth during late July and early August and again during late October and November. At the 12-meter depth, the nitrite standard was exceeded during July and again during early October. Nitrite concentrations did not exceed the standard in the deeper waters most affected by application of nitrate. 2018 sampling results are included in the DUSR in Appendix 8C.

8.2.7 2018 Lake Water Mercury Concentrations

Table 8.5 summarizes total mercury and methylmercury concentrations in water samples collected in 2018 near the lake bottom at South Deep. Methylmercury was not significantly released from underlying sediment to lower hypolimnion waters during the summer of 2018 when deep lake waters would be prone to methylmercury release in the absence of nitrate addition. This lack of methylmercury release from SMU 8 sediment demonstrates that nitrate addition was again effective in 2018 as it has been since the nitrate addition program began in 2011. From the beginning of the 2018 nitrate applications on June 12 through turnover of the lake on October 25, the maximum concentration of methylmercury observed in the lower waters of the lake was 0.141 ng/L (where 1 ng/L is 0.000001 mg/L) on August 21, 2018, at the 18-meter water depth (Figures 8.12 and 13). Figure 8.13 presents methylmercury and unfiltered total mercury results measured at South Deep over time at water depths of 2 meters (epilimnion), 12 meters (near the top of the hypolimnion), 16 meters (mid-to-lower hypolimnion), and 18 meters (bottom of the hypolimnion). Figure 8.13 shows the highest total mercury concentration (3.58 ng/L) was measured in the sample collected from the 18-meter water depth on November 7. As in past years, total mercury concentrations were elevated during October and November, although peak concentrations in 2018 were lower than in most prior years (e.g., peaks of 11.4 ng/L in 2014, 5.9 ng/L in 2015, 5.09 ng/L in 2016, and 3.34 ng/L in 2017). Methylmercury concentrations remained low during this period. These higher total mercury concentrations during fall may be caused by wind driven resuspension of mercury contaminated sediments. The lower values observed in 2018 are generally consistent with cleaner incoming sediments due to the progression of MNR.

Volume-weighted average hypolimnion water concentrations for methylmercury, dissolved oxygen, and nitrate-nitrogen for the summer-fall time period from 2007 through 2018 are presented in Figure 8.14 (a-c). Methylmercury concentrations were considerably lower in the lake's hypolimnion in 2011 through 2018 compared to recent prior years (Figures 8.14 and 8.15). Low methylmercury concentrations in Onondaga Lake since 2011 are consistent with the higher nitrate concentrations (as a result of nitrate additions) in those years compared to recent prior years. Methylmercury concentrations in Onondaga Lake hypolimnion water have declined dramatically aided by the addition of nitrate. Methylmercury in the lower hypolimnion has been barely detectable since nitrate has been added beginning in 2011.

Table 8.6 summarizes dissolved mercury concentrations in water samples collected in 2018 at the 2-meter water depth at South Deep. None of the 13 dissolved mercury results for water samples collected at this depth in 2018 exceeded the New York State SWQS for dissolved mercury (0.7 ng/L). Mercury results from supplemental sampling, conducted on September 20, 2018 at locations with low nitrate concentrations, are also presented in Table 8.6. Total and methylmercury concentrations at these three locations were similar to concentrations at South Deep. None of the results from water samples collected during August, September and October at the 16-meter depth in the lake's hypolimnion exceeded the New York State SWQS for dissolved mercury. The highest dissolved mercury concentration measured in 2018 was 0.27 ng/L from a sample collected on November 19 at the 2-meter water depth.

8.2.8 Other Related 2018 Lake Monitoring

Additional monitoring completed in 2018 included laboratory analyses for soluble reactive phosphorus, ferrous iron, and manganese in deep waters that are anoxic during the summer period. An additional benefit to maintaining nitrate levels in the hypolimnion during periods of anoxia is that release of phosphorus from deep lake sediments has been reduced (Figure 8.16). The presence of nitrate in waters near the lake bottom prevents the reduction of iron oxyhydroxides that is typical in anaerobic surface sediments. This, in turn, reduces the release of phosphorus bound to those compounds. The same mechanism preventing release of phosphorus from anaerobic lake sediment is thought to control the release of methylmercury from sediments (Matthews et al. 2013).

Ferrous iron, manganese, and total dissolved gas were collected again at the beginning of the field season in 2018. However, as per the recommendation made in the approved 2017 Nitrate Addition Report (Parsons and UFI 2018), analysis of these analytes was discontinued in July 2018. Those data that were collected prior to the approval of this recommendation are presented in Appendices 8D and 8F. Ferrous iron was detected at concentrations below the reporting limit during 2018 (the highest concentration was 11 µg/L). Manganese concentrations at the 18-meter water depth increased from 1.3 mg/L on July 2 to 1.98 mg/L on July 17 (see Appendix 8D). Total dissolved gas data are presented in Appendix 8E, and results from 2018 are consistent with prior year measurements.

The full data set for total mercury and methylmercury analysis in zooplankton, which are collected to as part of the tissue monitoring program to assess ongoing recovery, is presented in Section 3 of this report.

8.3 SUMMARY OF 2018 NITRATE ADDITION RESULTS AND RECOMMENDATIONS

8.3.1 2018 Results Summary

Results from the fifth year of full-scale nitrate addition (2018) showed successful delivery of sufficient quantities of nitrate to the lower hypolimnion of Onondaga Lake during summer stratification to meet the objective and thereby minimize methylmercury concentrations in deep waters of the lake. Nitrate-nitrogen concentrations were maintained at levels sufficient to inhibit the release of methylmercury from profundal zone sediments. Methylmercury release into the water column from profundal zone sediment continues to be effectively controlled.

A total of 104.5 MT of nitrate-nitrogen were added to the hypolimnion of Onondaga Lake between June 12 and October 16, 2018. Sediment nitrate demand in the summer of 2018 was approximately 0.8 MT per day, equal to the nitrate demand of 0.8 MT per day included in the earlier nitrate addition design report on which applications of nitrate beginning in 2011 were based. Applications of nitrate continued uninterrupted at a typical pace of two to three applications per week with slightly increased frequency in August and September.

8.3.2 Five Year Review Results Summary

Full-scale nitrate addition has been conducted annually since 2014, following the completion of the three year pilot study from 2011 through 2013. Nitrate addition has been effective in maintaining nitrate concentrations in the hypolimnion that are above the foal of 1 mg/L, with a few exceptions in the upper hypolimnion in 2016 and 2018. However, there is no evidence that methylmercury releases resulted from these isolated lower nitrate concentrations. Nitrate addition has therefore been effective in inhibiting the release of methylmercury from sediment into the deep water portions of the lake, resulting in lower concentrations of methylmercury in lake water and zooplankton.

Nitrate addition and the associated monitoring of surface water will continue as indicated in the Nitrate O&M Plan.

8.3.3 Recommendations and 2019 Nitrate Addition

Part of the ongoing assessment of the nitrate addition program is to make it more effective and efficient. With this aim, a fixed application station was piloted at the South1 application station. The pilot station successfully delivered nitrate to the deep-water areas in the vicinity of the Lake from August through October 2018. Since the fixed station is safer and more time efficient, fixed application stations are recommended to be used in 2019 at not only South1 in 2019, but also at the South2 and North application locations. This change in implementation will result in increased efficiency of the nitrate addition program without compromising the current level of environmental protection. The traditional application method, which uses a manifold of flexible hosing that is assembled and disassembled daily, will be maintained as a backup application method.

Nitrification of ammonia, which is part of the treatment process of wastewater by Syracuse Metro, will temporarily cease operation from approximately October 16, 2018, to March 18, 2019, so that the second phase of necessary upgrades can be made to the treatment system as a follow up to the 2017 upgrade. This shut down will likely result in lower than normal lake nitrate concentrations during the spring of 2019, as did the shutdown from October 2017 to March 2018. An earlier than typical mobilization for the 2019 field season and an increased number of nitrate applications will likely be needed again in 2019 to offset the reduced nitrate supply from Metro. However, protocols established by the O&M Plan, such as additional monitoring of nitrate concentrations and mercury analysis, will aid in evaluating the continued achievement of the nitrate addition program goals and protection of the environment and Onondaga Lake during the 2019 field season.

The goal of nitrate additions in 2019 will continue to be to maintain nitrate above 1 mg/L in the lower hypolimnion. The efficacy of lowering the target nitrate concentration while still maintaining the same level of protectiveness will be evaluated during the 2019 season, with a recommendation to be made in the 2019 report, as necessary.

SECTION 9

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TABLES

Table 2.1
2018 Vegetation Data Summary
Mouth of Ninemile Creek Restoration Area

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Relative Cover
Stuckenia pectinata	Sago pondweed	OBL	21.7%
Ceratophyllum demersum	Coontail	OBL	16.0%
Elodea canadensis	Common waterweed	OBL	14.4%
Heteranthera dubia	Water stargrass	OBL	10.7%
Typha latifolia	Broadleaf cattail	OBL	8.9%
Echinochloa spp.	Cockspur grass	FACW	3.7%
Pontederia cordata	Pickerelweed	OBL	3.5%
Schoenoplectus tabernaemontani	Softstem bulrush	OBL	3.3%
Potamogeton crispus	Curly pondweed	OBL	2.0%
Eleocharis spp.	Spikerush	OBL	1.6%
Spartina pectinata	Prairie cordgrass	FACW	1.4%
Chara spp.	Stonewort	OBL	1.4%
Zizania aquatica	Wild rice	OBL	1.2%
other species (<1% rel. cover, 56 species)			10.3%
		Total	100%

[1] Botanical nomenclature follows Mitchell and Tucker (1997)

[2] Wetland Indicator Status nomenclature:

Obligate Wetland (OBL): occurs almost always (estimated probability >99%) in wetlands.
Facultative Wetland (FACW): usually occurs in wetlands (estimated probability 67%-99%), but is occasionally found in non-wetlands.
Facultative (FAC): equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67%-99%), but is occasionally found in wetlands (estimated probability 1%-33%).
Obligate Upland (UPL): occurs almost always (estimated probability >99%) in non-wetlands.

[3] References for Wetland Statuses throughout document from the following:

http://plants.usda.gov

https://gobotany.newenglandwild.org

Table 2.2
2018 Vegetation Data Summary
Outboard/Harbor Brook Restoration Area

Scientific Name[1]	Common Name	Wetland Indicator Status[2,3]	Relative Cover
Typha latifolia	Broadleaf cattail	OBL	27.4%
Elodea canadensis	Common waterweed	OBL	10.2%
Echinochloa spp.	Cockspur grass	FACW	9.6%
Panicum spp.	Panicgrass	FAC	4.0%
Persicaria pensylvanica	Pennsylvania smartweed	FACW	3.3%
Schoenoplectus tabernaemontani	Softstem bulrush	OBL	2.8%
Juncus effusus	Common rush	OBL	2.2%
Ceratophyllum demersum	Coontail	OBL	2.1%
Stuckenia pectinata	Sago pondweed	OBL	2.0%
Puccinellia distans	Weeping alkaligrass	FACW	2.0%
Pontederia cordata	Pickerelweed	OBL	1.4%
Leersia oryzoides	Rice cutgrass	OBL	1.2%
Elymus virginicus	Virginia wildrye	FACW	1.2%
Panicum virgatum	Switchgrass	FAC	1.1%
Bidens cernua	Nodding beggartick	OBL	1.1%
other species (<1% rel. cover, 56 species)			28.4%
		Total	100%

[1] Botanical nomenclature follows Mitchell and Tucker (1997)

[2] Wetland Indicator Status nomenclature:

Obligate Wetland (OBL): occurs almost always (estimated probability >99%) in wetlands.
Facultative Wetland (FACW): usually occurs in wetlands (estimated probability 67%-99%), but is occasionally found in non-wetlands.
Facultative (FAC): equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).

Facultative Upland (FACU): usually occurs in non-wetlands (estimated probability 67%-99%), but is occasionally found in wetlands (estimated probability 1%-33%).

Obligate Upland (UPL): occurs almost always (estimated probability >99%) in non-wetlands.

[3] References for Wetland Statuses throughout document from the following:

http://plants.usda.gov

https://gobotany.newenglandwild.org

Table 2.3
2018 Tree Condition Survey
Outboard/Harbor Brook Restoration Area

Number of Trees	Species[2]	Condition: Overall Condition: Excellent	Very Good	Good	Poor	Very Poor	Dead/Removed[3]
19	American sycamore (*Platanus occidentalis*)	8	10	1	0	0	0
22	Black willow (*Salix nigra*)[1]	15	6	1	0	0	0
6	Northern white cedar (*Thuja occidentalis*)	2	1	1	0	1	1
7	Quaking aspen (*Populus tremuloides*)	6	1	0	0	0	0
24	Red maple (*Acer rubrum*)[1]	2	15	4	1	1	1
2	Silver maple (*Acer saccharinum*)	1	1	0	0	0	0
23	Swamp white oak (*Quercus bicolor*)	11	9	2	1	0	0
103	**Total trees & observed condition**	**45**	**43**	**9**	**2**	**2**	**2**

[1]Installed in 2018 at a higher than 1:1 ratio with smaller sized potted trees. Trees were planted in close proximity to each other. The tree with the best overall condition is recorded in the table.

[2] Scientific names follow the New York Flora Atlas (Weldy et al. 2017).

[3] Red Maple noted as Dead/Removed in the 2018 survey were replaced in Fall 2018

Table 2.4
Species Richness of the Fish Community in 2018

	Lakewide Total	Total For Remediation Areas	Total For Unremediated Areas
Baseline (2008-2011)	40	37	36
Construction (2012-2016)	38	33	36
2017	41	39	34
2018	42	36	38

Table 2.5
2018 Onondaga Lake Biological Assessment Profile Scores

Location	Sampling Method	Area Type	BAP Score 1[1]	BAP Score 2[1]	BAP Mean	Area Mean
Remediation Area A						
OL-BMI-GA01	Multiplate	Remediation	4.6	-	4.6	2.9
OL-BMI-GA02	Multiplate	Remediation	2.8	-	2.8	
OL-BMI-GA03	Multiplate	Remediation	1.4	-	1.4	
OL-BMI-SA01	Ponar	Remediation	2.5	2.2	2.4	2.5
OL-BMI-SA02	Ponar	Remediation	3.9	5.4	4.7	
OL-BMI-SA03	Ponar	Remediation	1.9	2.5	2.2	
OL-BMI-TA01	Ponar	Remediation	2.1	2.6	2.4	
OL-BMI-TA02	Ponar	Remediation	1.6	1.4	1.5	
OL-BMI-TA03	Ponar	Remediation	1.7	1.9	1.8	
Remediation Area B						
OL-BMI-GB01	Multiplate	Remediation	1.6	-	1.6	2.5
OL-BMI-GB02	Multiplate	Remediation	2.9	-	2.9	
OL-BMI-GB03	Multiplate	Remediation	3.1	-	3.1	
OL-BMI-SB01	Ponar	Remediation	1.5	1.1	1.3	3.4
OL-BMI-SB02	Ponar	Remediation	0.8	2.7	1.7	
OL-BMI-SB03	Ponar	Remediation	4.7	4.1	4.4	
OL-BMI-TB01	Ponar	Remediation	3.8	5.1	4.4	
OL-BMI-TB02	Ponar	Remediation	3.4	4.8	4.1	
OL-BMI-TB03	Ponar	Remediation	5.1	3.7	4.4	
Remediation Area C						
OL-BMI-GC01	Multiplate	Remediation	2.0	-	2.0	1.7
OL-BMI-GC02	Multiplate	Remediation	1.2	-	1.2	
OL-BMI-GC03	Multiplate	Remediation	2.0	-	2.0	
OL-BMI-SC01	Ponar	Remediation	1.8	2.6	2.2	1.8
OL-BMI-SC02	Ponar	Remediation	1.1	1.2	1.2	
OL-BMI-SC03	Ponar	Remediation	1.7	2.3	2.0	
Remediation Area D						
OL-BMI-GD01	Multiplate	Remediation	2.9	-	2.9	3.2
OL-BMI-GD02	Multiplate	Remediation	3.1	-	3.1	
OL-BMI-GD03	Multiplate	Remediation	3.7	-	3.7	
OL-BMI-SD01	Ponar	Remediation	1.2	1.4	1.3	3.0
OL-BMI-SD02	Ponar	Remediation	0.0	-	0.0	
OL-BMI-SD03	Ponar	Remediation	1.7	1.8	1.8	
OL-BMI-TD01	Ponar	Remediation	7.8	7.2	7.5	
OL-BMI-TD02	Ponar	Remediation	4.7	5.1	4.9	
OL-BMI-TD03	Ponar	Remediation	2.8	1.9	2.3	

Table 2.5
(Continued)
2018 Onondaga Lake Biological Assessment Profile Scores

Location	Sampling Method	Area Type	BAP Score 1[1]	BAP Score 2[1]	BAP Mean	Area Mean
Remediation Area E						
OL-BMI-CE01	Multiplate	Remediation	1.9	-	1.9	1.7
OL-BMI-CE02	Multiplate	Remediation	1.3	-	1.3	
OL-BMI-CE03	Multiplate	Remediation	2.6	-	2.6	
OL-BMI-GE01	Multiplate	Remediation	1.4	-	1.4	
OL-BMI-GE02	Multiplate	Remediation	1.3	-	1.3	
OL-BMI-GE03	Multiplate	Remediation	1.6	-	1.6	
OL-BMI-SE01	Ponar	Remediation	1.1	1.1	1.1	1.3
OL-BMI-SE02	Ponar	Remediation	0.7	1.9	1.3	
OL-BMI-SE03	Ponar	Remediation	1.5	1.6	1.5	
CSX Area						
OL-BMI-CSX01	Ponar	Remediation	2.1	1.6	1.8	3.6
OL-BMI-CSX02	Ponar	Remediation	3.1	4.1	3.6	
OL-BMI-CSX03	Ponar	Remediation	5.9	4.8	5.3	
Reference Locations						
OL-BMI-RR01A	Ponar	Reference	1.0	1.2	1.1	1.4
OL-BMI-RR01B	Ponar	Reference	1.5	1.3	1.4	
OL-BMI-RR01C	Ponar	Reference	1.3	2.1	1.7	
OL-BMI-RR02A	Ponar	Reference	6.5	6.7	6.6	3.6
OL-BMI-RR02B	Ponar	Reference	2.3	3.8	3.1	
OL-BMI-RR02C	Ponar	Reference	1.4	0.6	1.0	
OL-BMI-RR03A	Ponar	Reference	5.5	5.5	5.5	3.0
OL-BMI-RR03B	Ponar	Reference	1.3	1.2	1.2	
OL-BMI-RR03C	Ponar	Reference	3.0	1.4	2.2	
Average Ponar BAP Score (Remediated Areas)						2.6
Average Ponar BAP Score (Unremediated Areas)						2.6
Average Multiplate BAP Score (Remediated Areas)						2.3
Average CSX BAP Score						3.6
Average Baseline Ponar BAP Score (Remediation Areas)						3.9
Average Baseline Ponar BAP Score (Unremediated Areas)						4.0

1. Biological Assessment Profile (BAP) calculated for two of three replicates where samples were collected via ponar. Where samples were collected via multiplates, one of two replicates was identified.

Table 2.6
2018 Maintenance Summary
Mouth of Ninemile Creek and Outboard/Harbor Brook Restoration Areas

Month	Task	Site	Description
Action Items and Maintenance Efforts			
July/October	Herbicide Application	Mouth of Ninemile Creek, Outboard/Harbor Brook	Applications of the herbicide Rodeo® to invasive species were carried out
August	Mechanical Removal of Water Chestnut	Restoration Area E (near Ley Creek)	Hand pulled water chestnut out of lake
November	Large Tree Replacement	Outboard	Replaced a dead tree noted in the 2018 survey at a 3:1 ratio[1]
Supplemental Plantings and Seeding			
May	Bare Root Plantings	Mouth of Ninemile Creek, Outboard/Harbor Brook	Installed bare root trees
May-July	Enhancement Plantings		Planted herbaceous plugs in sparsely vegetated areas
May-July	Seeding		Seeded sparsely vegetated areas
November	Woody Plantings		Planted potted woody species

[1] Quantities and species can be found in Table 2-9.

Table 3.1
Summary of 2018 Fish Tissue Chemical Concentrations

(wet-weight basis)

Parameter	Prep	Species	Sample Size	Number of Detections	Arithmetic Mean[1]	Median[1]	Min[1,2]	Max[1,2]	Standard Deviation[3]	Standard Error[4]	95% UCL[5,6]
Mercury (mg/kg)	whole body	Prey fish	24	11	0.07	0.04	*0.037U*	0.16	0.04	0.01	0.09
	whole body	White sucker	24	14	0.17	0.16	*0.037U*	0.40	0.13	0.03	0.21
	fillet	Smallmouth bass	25	25	0.78	0.78	0.23	1.75	0.38	0.08	0.91
	fillet	Walleye	25	25	0.71	0.78	0.06	1.29	0.30	0.06	0.81
	fillet	Pumpkinseed	25	16	0.09	0.08	*0.036U*	0.22	0.05	0.01	0.11
	fillet	Common carp	25	20	0.10	0.08	0.01	0.34	0.09	0.02	0.14
Total PCBs (mg/kg)[7]	whole body	Prey fish	24	24	0.09	0.04	0.02	0.43	0.12	0.02	0.13
	whole body	White sucker	24	23	0.10	0.08	0.03	0.32	0.07	0.01	0.13
	fillet	Smallmouth bass	25	25	0.47	0.40	0.07	1.15	0.28	0.06	0.57
	fillet	Walleye	25	25	0.96	0.87	0.13	2.92	0.74	0.15	1.21
	fillet	Pumpkinseed	25	23	0.09	0.07	*0.017U*	0.29	0.06	0.01	0.12
	fillet	Common carp	25	25	0.27	0.10	0.01	1.66	0.40	0.08	0.44
Sum of DDT and Metabolites (mg/kg)[7]	whole body	Prey fish	24	24	0.01	0.01	0.001	0.02	0.004	0.0009	0.01
	whole body	White sucker	24	20	0.03	0.01	0.003	0.41	0.08	0.02	0.10
Hexachlorobenzene (mg/kg)	whole body	Prey fish	24	0	0.001	0.002	*0.0015U*	*0.0015U*	0.00002	0.000004	--
	whole body	White sucker	24	1	0.01	0.002	*0.0015U*	*0.015U*	0.01	0.001	--
	fillet	Smallmouth bass	25	0	0.01	0.01	*0.0075U*	*0.015U*	0.002	0.0004	--
	fillet	Walleye	25	3	0.01	0.01	0.01	*0.030U*	0.01	0.001	0.01
	fillet	Pumpkinseed	23	0	0.01	0.01	*0.0015U*	*0.030U*	0.01	0.001	--
	fillet	Common carp	25	2	0.01	0.01	*0.0015U*	*0.029U*	0.01	0.001	0.00
Percent Lipid (% by weight)	whole body	Prey fish	24	24	2.77	2.35	0.53	7.30	1.57	0.32	3.44
	whole body	White sucker	24	24	1.94	1.65	0.54	5.80	1.29	0.26	2.39
	fillet	Smallmouth bass	25	25	1.93	1.80	0.31	4.10	1.06	0.21	2.29
	fillet	Walleye	25	25	6.24	6.90	0.68	14.40	3.42	0.68	7.41
	fillet	Pumpkinseed	25	25	1.63	1.50	0.40	3.50	0.90	0.18	1.94
	fillet	Common carp	25	25	3.03	2.20	0.64	8.70	2.09	0.42	3.91
Dioxin/Furan Total TEQ (ng/kg)[8,9]	fillet	Smallmouth bass	13	13(161/221)	1.04	0.74	0.35	2.19	0.59	0.16	1.33
	fillet	Walleye	13	13 (185/221)	1.81	1.30	0.45	4.97	1.44	0.40	2.52
	fillet	Pumpkinseed	12	12 (163/204)	0.54	0.42	0.15	1.23	0.37	0.11	0.73
	fillet	Common carp	14	14 (210/238)	1.74	0.83	0.34	6.78	2.17	0.58	3.24

1. U = not-detected; non-detects included at half the MDL for mercury and dioxin/furan TEQ; non-detects included at half the RL for other analytes.
2. Some detected concentrations were found to be lower than the RL or MDL of some non-detect results.
3. Standard deviation is an estimate of the variability of the data points used to calculate the mean.
4. Standard error is an estimate of how close the calculated mean is likely to be to the true population mean.
5. 95% UCL was calculated using ProUCL version 5.1
6. 95% UCL is an estimate of the upper bound for the true population mean; 95% UCL was not calculated when 1 or fewer results were detects.
7. 1/2 the RL was used for non-detects in calculations.
8. For individual non-detects, 1/2 the MDL was used in calculations.
9. Number of detections is total TEQ detections; numbers in parentheses are number of congeners detected/congeners analyzed (i.e., 17 congeners times 12 samples).

Acronyms:

DDT = dichlorodiphenyltrichloroethane
MDL = method detection limit
mg/kg = milligrams per kilogram
ng/kg = nanograms per kilogram
PCB = polychlorinated biphenyl
RL = reporting limit
TEQ = toxicity equivalent quotient
UCL = upper confidence limit

Table 3.2
Mercury Concentrations (mg/kg wet weight) in Onondaga Lake Zooplankton Collected at South Deep in 2018

2018 Sampling Date	Total Mercury (mg/kg wet weight)	Validation Qualifier	Methyl Mercury (mg/kg wet weight)	Validation Qualifier	Methylmercury (as Percent of Total Mercury)
May 16	0.0352		0.0015	J	4%
June 12	0.0342		0.0094		27%
July 2	0.0314		0.0059		19%
July 17	0.0373		0.0017		5%
July 31	0.167		0.0011	J	1%
August 16	NA		0.0021	J	NA
August 28	NA		0.0014	J	NA
September 5	NA		0.0011	J	NA
September 11	NA		0.0021	J	NA
September 18	NA		0.0026	J	NA
September 27	NA		0.0008	U	NA
October 2	NA		0.0029	J	NA
October 9	NA		0.0036	J	NA
October 16	0.0568		0.0027		5%
October 24	NA		0.0064		NA
November 7	NA		0.0081		NA
November 19	NA		0.0093	J	NA

NA: no data available due to methylmercury analysis being prioritized over total mercury analysis in cases where sample mass is limited.
J: estimated concentration

Table 3.3
Benthic Macroinvertebrate Tissue
Concentration Summary (wet weight basis)

Location	Species	Total Mercury (mg/kg)	Methylmercury (mg/kg)
EAST-01-13-17	*Chironomidae*	0.0417	0.0061
RAD-D-03-13-17	*Oligochaeta*	0.0612	0.0008
WB1-8-02-13-17	*Chironomidae*	0.0370	0.0043
Average *Chironomidae*		0.0394	0.0052
Average *Oligochaeta*		0.0612	0.0008
Overall Average		0.0466	0.0037

Table 3.4
Proposed 2020 Changes to the Fish Tissue Monitoring Program and Rationale

Analyte	Species	Performance criteria or target concentration	Mean[a] less than performance criteria or target for 3 years in a row[b]
Mercury	Small prey fish	0.14 mg/kg	Yes
PCBs	Pumpkinseed	0.3 mg/kg	Yes
	Small prey fish	0.19 mg/kg[c]	Yes
HCB	All species	None	--[d]
Dioxins/furans	Pumpkinseed	4 ng/kg[e]	Yes
DDT	Small prey fish[c]	0.049 mg/kg[c]	Yes
	Large prey fish	0.15 mg/kg[c]	Yes

Notes:

[a] Mean concentrations are lake-wide averages; 95 percent UCL on the mean also met for three years in a row.

[b] Performance criteria should be met at least three years in a row or four out of five to verify achievement of goals.

[c] Lowest-observed-adverse-effect level (LOAEL) target in Table 7 of ROD. For PCBs in prey fish, 0.19 mg/kg is the LOAEL target tissue concentration for river otter, which was modeled with a diet of small and large prey fish, as presented in Appendix G of the Onondaga Lake Feasibility Study Report (Parsons 2004).

[d] All data (all species and all years) are well below the NYSDEC ecological risk targets (0.33 and 0.2 mg/kg) (NYSDEC 1984, *Niagara River Biota Contamination Project: Fish Flesh Criteria for Piscivorous Wildlife*), and HCB was undetected in most samples.

[e] Upper end of target tissue concentration range based on reasonable maximum exposure of 54 meals/year; lower end is below background (Parsons 2004).

Table 4.1
Mercury Results for 2017 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	Dissolved Mercury[1,2]		Total Mercury		Methylmercury	
Pre-Turnover	North Deep	09/21/2017	6.0	ng/L	0.11	J	0.48	J	0.11	
	South Deep	09/21/2017	6.0	ng/L	0.08	J	0.43	J	0.11	J
	OL-RAA-SW-01	09/21/2017	1.5	ng/L	0.10	J	2.29		0.21	
	OL-RAB-SW-01	09/21/2017	1.5	ng/L	0.10	J	0.52		0.07	
	OL-RAB-SW-02	09/21/2017	1.5	ng/L	0.21	J	0.71		0.06	
	OL-RAC-SW-01	09/21/2017	1.5	ng/L	0.08	U	0.53		0.11	
	OL-RAC-SW-02	09/21/2017	1.5	ng/L	0.10	J	1.16		0.09	
	OL-RAD-SW-01	09/21/2017	1.5	ng/L	0.08	J	0.50		0.10	
	OL-RAD-SW-02	09/21/2017	1.5	ng/L	0.08	U	1.07		0.10	
	OL-RAE-SW-01	09/21/2017	1.0	ng/L	0.22	J	1.11		0.16	
	OL-RAE-SW-02	09/21/2017	1.5	ng/L	0.14	J	0.59		0.11	
	OL-RAE-SW-03	09/21/2017	1.5	ng/L	0.20	J	0.64		0.13	
Post-Turnover	North Deep	11/13/2017	1.5	ng/L	0.25	J	1.24		0.04	J
	South Deep	11/13/2017	1.5	ng/L	0.24	J	1.40		0.06	
	OL-RAA-SW-01	11/13/2017	1.5	ng/L	0.27	J	1.75		0.11	
	OL-RAB-SW-01	11/13/2017	1.5	ng/L	0.25	J	1.23		0.05	
	OL-RAB-SW-02	11/13/2017	1.5	ng/L	0.29	J	0.58		0.05	
	OL-RAC-SW-01	11/13/2017	1.5	ng/L	0.25	J	1.07		0.06	
	OL-RAC-SW-02	11/13/2017	1.5	ng/L	0.29	J	0.96		0.05	J
	OL-RAD-SW-01	11/13/2017	1.5	ng/L	0.25	J	1.27		0.05	
	OL-RAD-SW-02	11/13/2017	1.5	ng/L	0.25	J	1.27		0.05	J
	OL-RAE-SW-01	11/13/2017	1.0	ng/L	0.37	J	1.44		0.03	U
	OL-RAE-SW-02	11/13/2017	1.5	ng/L	0.24	J	1.11		0.04	J
	OL-RAE-SW-03	11/30/2017	1.5	ng/L	0.29	J	1.07		0.20	

Notes:
1. Goal for dissolved mercury concentrations for the protection of wildlife is 2.6 ng/L or lower
2. Goal for dissolved mercury concenrtations for human health via fish consumption is 0.7 ng/L or lower
U: not detected at specified reporting limit
J: estimated concentration

Table 4.2
VOC and SVOC Results for 2017 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	1,2,3-TRICHLOROBENZENE		1,3,5-TRICHLOROBENZENE		BENZENE		CHLOROBENZENE	
Surface Water Quality Standards/Guidance Values				ug/L	5		5		10 [1]		5 [1]	
Pre-Turnover	North Deep	09/21/2017	6.0	ug/L	5	U	5	U	1	U	1	U
	South Deep	09/21/2017	6.0	ug/L	5	U	5	U	1	U	1	U
	OL-RAA-SW-01	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAB-SW-01	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAB-SW-02	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAC-SW-01	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAC-SW-02	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAD-SW-01	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAD-SW-02	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAE-SW-01	09/21/2017	1.0	ug/L	5	U	5	U	1	U	1	U
	OL-RAE-SW-02	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U
	OL-RAE-SW-03	09/21/2017	1.5	ug/L	5	U	5	U	1	U	1	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.2
(Continued)
VOC and SVOC Results for 2017 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	ETHYLBENZENE		O-XYLENE		M&P-XYLENE		TOLUENE		XYLENES, TOTAL	
Surface Water Quality Standards/Guidance Values				ug/L	**17** [1]		**65** [1]		**65** [1]		**100** [1]		**65** [1]	
Pre-Turnover	North Deep	09/21/2017	6.0	ug/L	1	U	1	U	1	U	1	U	1	U
	South Deep	09/21/2017	6.0	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAA-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAB-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAB-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAC-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAC-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAD-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAD-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAE-SW-01	09/21/2017	1.0	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAE-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U
	OL-RAE-SW-03	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U	1	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.2
(Continued)
VOC and SVOC Results for 2017 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	1,2,4-TRICHLOROBENZENE		1,2-DICHLOROBENZENE		1,3-DICHLOROBENZENE		1,4-DICHLOROBENZENE	
Surface Water Quality Standards/Guidance Values				ug/L	**5** [1]		**5** [1]		**5** [1]		**5** [1]	
Pre-Turnover	North Deep	09/21/2017	6.0	ug/L	1	U	1	U	1	U	1	U
	South Deep	09/21/2017	6.0	ug/L	1	U	1	U	1	U	1	U
	OL-RAA-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAB-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAB-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAC-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAC-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAD-SW-01	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAD-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAE-SW-01	09/21/2017	1.0	ug/L	1	U	1	U	1	U	1	U
	OL-RAE-SW-02	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U
	OL-RAE-SW-03	09/21/2017	1.5	ug/L	1	U	1	U	1	U	1	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.2
(Continued)
VOC and SVOC Results for 2017 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	ACENAPHTHENE		ANTHRACENE		BENZO(A)ANTHRACENE		BENZO(A)PYRENE	
Surface Water Quality Standards/Guidance Values				ug/L	**5.3 [1]**		**3.8 [1]**		**0.03 [1]**		**0.0012 [1]**	
Pre-Turnover	North Deep	09/21/2017	6.0	ug/L	0.51	U	0.51	U	0.51	U	0.51	U
	South Deep	09/21/2017	6.0	ug/L	0.51	U	0.51	U	0.51	U	0.51	U
	OL-RAA-SW-01	09/21/2017	1.5	ug/L	0.52	U	0.52	U	0.52	U	0.52	U
	OL-RAB-SW-01	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	0.51	U
	OL-RAB-SW-02	09/21/2017	1.5	ug/L	0.52	U	0.52	U	0.52	U	0.52	U
	OL-RAC-SW-01	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	0.51	U
	OL-RAC-SW-02	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	0.51	U
	OL-RAD-SW-01	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	0.51	U
	OL-RAD-SW-02	09/21/2017	1.5	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAE-SW-01	09/21/2017	1.0	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAE-SW-02	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	0.51	U
	OL-RAE-SW-03	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	0.51	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.2
(Continued)
VOC and SVOC Results for 2017 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	FLUORENE		NAPHTHALENE		PHENANTHRENE		PHENOL		PYRENE	
Surface Water Quality Standards/Guidance Values				ug/L	**0.54** [1]		**13** [1]		**5** [1]		**5**		**4.6** [1]	
Pre-Turnover	North Deep	09/21/2017	6.0	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U
	South Deep	09/21/2017	6.0	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U
	OL-RAA-SW-01	09/21/2017	1.5	ug/L	0.52	U	0.52	U	0.52	U	1	U	0.52	U
	OL-RAB-SW-01	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U
	OL-RAB-SW-02	09/21/2017	1.5	ug/L	0.52	U	0.52	U	0.52	U	1	U	0.52	U
	OL-RAC-SW-01	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U
	OL-RAC-SW-02	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U
	OL-RAD-SW-01	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U
	OL-RAD-SW-02	09/21/2017	1.5	ug/L	0.5	U	0.5	U	0.5	U	1	U	0.5	U
	OL-RAE-SW-01	09/21/2017	1.0	ug/L	0.5	U	0.5	U	0.5	U	1	U	0.5	U
	OL-RAE-SW-02	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U
	OL-RAE-SW-03	09/21/2017	1.5	ug/L	0.51	U	0.51	U	0.51	U	1	U	0.51	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.

U: not detected at specified reporting limit

J: estimated concentration

Table 4.3
Summary of Total PCB Results for 2017 Surface Water Compliance Sampling (ng/L)

Period	Location	Sample Date	Sample Depth (ft)	No. of Congeners Sampled For	Total No. of Congeners Detected	Total PCBs
Pre-Turnover	DEEP_N	9/21/2017	6.0	168	16	0.46
	DEEP_S	9/21/2017	6.0	168	16	0.44
	OL-RAA-SW-01	9/21/2017	1.5	168	28	0.97
	OL-RAB-SW-01	9/21/2017	1.5	168	28	0.93
	OL-RAB-SW-02	9/21/2017	1.5	168	23	0.74
	OL-RAC-SW-01	9/21/2017	1.5	168	15	0.43
	OL-RAC-SW-02	9/21/2017	1.5	168	37	1.77
	OL-RAD-SW-01	9/27/2017	1.5	168	22	0.67
	OL-RAD-SW-02	9/27/2017	1.5	168	16	0.44
	OL-RAE-SW-01	9/27/2017	1.0	168	24	0.75
	OL-RAE-SW-02	9/27/2017	1.5	168	27	1.31
	OL-RAE-SW-03	9/27/2017	1.5	168	55	4.91
Post-Turnover	DEEP_N	11/13/2017	1.5	168	29	1.16
	DEEP_S	11/13/2017	1.5	168	38	1.93
	OL-RAA-SW-01	11/13/2017	1.5	168	15	0.43
	OL-RAB-SW-01	11/13/2017	1.5	168	36	1.62
	OL-RAB-SW-02	11/13/2017	1.5	168	23	0.83
	OL-RAC-SW-01	11/13/2017	1.5	168	36	1.76
	OL-RAC-SW-02	11/13/2017	1.5	168	29	1.27
	OL-RAD-SW-01	11/13/2017	1.5	168	35	1.64
	OL-RAD-SW-02	11/13/2017	1.5	168	41	2.01
	OL-RAE-SW-01	11/13/2017	1.0	168	30	1.10
	OL-RAE-SW-02	11/13/2017	1.5	168	43	2.47
	OL-RAE-SW-03	12/4/2017	1.5	168	24	1.17

Notes:
1. When calculating Total PCBs, ND=0
2. Goals for PCB concentration of 0.12 ng/L for the Protection of Wildlife and 0.001 ng/L for the protection of human health via fish consumption.

Table 4.4
Mercury Results for 2018 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	Dissolved Mercury[1,2]		Total Mercury		Methylmercury	
Pre-Turnover	North Deep	09/20/2018	6.6	ng/L	0.18	J	0.98	J	0.026	UJ
	South Deep	09/20/2018	6.6	ng/L	0.12	J	0.43	J	0.033	J
	OL-RAA-SW-01	09/20/2018	0.33	ng/L	0.26	J	1.00		0.090	
	OL-RAB-SW-01	09/20/2018	1.65	ng/L	0.16	J	0.88		0.043	J
	OL-RAB-SW-02	09/20/2018	1.65	ng/L	0.18	J	0.59		0.111	
	OL-RAC-SW-01	09/20/2018	1.65	ng/L	0.16	J	0.44	J	0.026	U
	OL-RAC-SW-02	09/20/2018	1.65	ng/L	0.26	J	0.66		0.070	
	OL-RAD-SW-01	09/20/2018	1.65	ng/L	0.20	J	0.77		0.047	J
	OL-RAD-SW-02	09/20/2018	1.65	ng/L	0.15	J	1.04		0.029	J
	OL-RAE-SW-01	09/20/2018	0.66	ng/L	0.34	J	1.80		0.154	
	OL-RAE-SW-02	09/20/2018	1.65	ng/L	0.19	J	1.34		0.083	
	OL-RAE-SW-03	09/20/2018	1.65	ng/L	0.22	J	0.64		0.064	
Post-Turnover	North Deep	11/08/2018	6.6	ng/L	0.34	J	1.27		0.026	U
	South Deep	11/08/2018	6.6	ng/L	0.30	J	1.24		0.026	U
	OL-RAA-SW-01	11/08/2018	1.65	ng/L	0.40	J	1.65		0.070	
	OL-RAB-SW-01	11/08/2018	1.65	ng/L	0.24	J	0.79		0.026	U
	OL-RAB-SW-02	11/08/2018	0.99	ng/L	0.22	J	0.72		0.026	U
	OL-RAC-SW-01	11/08/2018	1.65	ng/L	0.20	J	0.96		0.026	U
	OL-RAC-SW-02	11/08/2018	1.65	ng/L	0.20	J	0.85		0.026	U
	OL-RAD-SW-01	11/08/2018	1.65	ng/L	0.22	J	0.87		0.026	U
	OL-RAD-SW-02	11/08/2018	1.65	ng/L	0.20	J	0.69		0.026	U
	OL-RAE-SW-01	11/08/2018	1.65	ng/L	0.22	J	0.58		0.026	U
	OL-RAE-SW-02	11/08/2018	1.65	ng/L	0.40	J	2.88		0.026	U
	OL-RAE-SW-03	11/08/2018	1.65	ng/L	0.32	J	2.35		0.045	J

Notes:
1. Goal for dissolved mercury concentrations for the protection of wildlife is 2.6 ng/L or lower
2. Goal for dissolved mercury concenrtations for human health via fish consumption is 0.7 ng/L or lower
3. U: not detected at specified reporting limit
4. J: estimated concentration

Table 4.5
VOC and SVOC Results for 2018 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	1,2,3-TRICHLOROBENZENE		1,3,5-TRICHLOROBENZENE		BENZENE		CHLOROBENZENE	
Surface Water Quality Standards/Guidance Values				ug/L	**5**		**5**		**10 [1]**		**5 [1]**	
Pre-Turnover	North Deep	09/14/2018	6.6	ug/L	5	U	5	U	1	U	1	U
	South Deep	09/14/2018	6.6	ug/L	5	U	5	U	1	U	1	U
	OL-RAA-SW-01	09/14/2018	0.66	ug/L	5	U	5	U	0.2	J	0.3	J
	OL-RAB-SW-01	09/14/2018	1.65	ug/L	5	U	5	U	1	U	1	U
	OL-RAB-SW-02	09/14/2018	1.65	ug/L	5	U	5	U	1	U	1	U
	OL-RAC-SW-01	09/14/2018	1.65	ug/L	5	U	5	U	1	U	1	U
	OL-RAC-SW-02	09/14/2018	1.65	ug/L	5	U	5	U	1	U	1	U
	OL-RAD-SW-01	09/14/2018	1.65	ug/L	5	U	5	U	1	U	1	U
	OL-RAD-SW-02	09/14/2018	1.65	ug/L	5	U	5	U	1	U	1	U
	OL-RAE-SW-01	09/14/2018	0.99	ug/L	5	U	5	U	1	U	1	U
	OL-RAE-SW-02	09/14/2018	1.65	ug/L	5	U	5	U	1	U	1	U
	OL-RAE-SW-03	09/14/2018	2.31	ug/L	5	U	5	U	1	U	1	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.5
(Continued)
VOC and SVOC Results for 2018 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	ETHYLBENZENE		O-XYLENE		M&P-XYLENE		TOLUENE		XYLENES, TOTAL	
Surface Water Quality Standards/Guidance Values				ug/L	**17** [1]		**65** [1]		**65** [1]		**100** [1]		**65** [1]	
Pre-Turnover	North Deep	09/14/2018	6.6	ug/L	1	U	1	U	5	U	1	U	5	U
	South Deep	09/14/2018	6.6	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAA-SW-01	09/14/2018	0.66	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAB-SW-01	09/14/2018	1.65	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAB-SW-02	09/14/2018	1.65	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAC-SW-01	09/14/2018	1.65	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAC-SW-02	09/14/2018	1.65	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAD-SW-01	09/14/2018	1.65	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAD-SW-02	09/14/2018	1.65	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAE-SW-01	09/14/2018	0.99	ug/L	1	U	1	U	5	U	0.3	J	5	U
	OL-RAE-SW-02	09/14/2018	1.65	ug/L	1	U	1	U	5	U	1	U	5	U
	OL-RAE-SW-03	09/14/2018	2.31	ug/L	1	U	1	U	5	U	1	U	5	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.5
(Continued)
VOC and SVOC Results for 2018 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	1,2,4-TRICHLOROBENZENE		1,2-DICHLOROBENZENE		1,3-DICHLOROBENZENE		1,4-DICHLOROBENZENE	
Surface Water Quality Standards/Guidance Values				ug/L	5 [1]		5 [1]		5 [1]		5 [1]	
Pre-Turnover	North Deep	09/14/2018	6.6	ug/L	2	U	2	U	2	U	2	U
	South Deep	09/14/2018	6.6	ug/L	2	U	2	U	2	U	2	U
	OL-RAA-SW-01	09/14/2018	0.66	ug/L	2	U	2	U	2	U	2	U
	OL-RAB-SW-01	09/14/2018	1.65	ug/L	2	U	2	U	2	U	2	U
	OL-RAB-SW-02	09/14/2018	1.65	ug/L	2	U	2	U	2	U	2	U
	OL-RAC-SW-01	09/14/2018	1.65	ug/L	2	U	2	U	2	U	2	U
	OL-RAC-SW-02	09/14/2018	1.65	ug/L	2	U	2	U	2	U	2	U
	OL-RAD-SW-01	09/14/2018	1.65	ug/L	2	U	2	U	2	U	2	U
	OL-RAD-SW-02	09/14/2018	1.65	ug/L	2	U	2	U	2	U	2	U
	OL-RAE-SW-01	09/14/2018	0.99	ug/L	2	U	2	U	2	U	2	U
	OL-RAE-SW-02	09/14/2018	1.65	ug/L	2	U	2	U	2	U	2	U
	OL-RAE-SW-03	09/14/2018	2.31	ug/L	2	U	2	U	2	U	2	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.5
(Continued)
VOC and SVOC Results for 2018 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	ACENAPHTHENE		ANTHRACENE		BENZO(A)ANTHRACENE		BENZO(A)PYRENE	
Surface Water Quality Standards/Guidance Values				ug/L	**5.3** [1]		**3.8** [1]		**0.03** [1]		**0.0012** [1]	
Pre-Turnover	North Deep	09/14/2018	6.6	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	South Deep	09/14/2018	6.6	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAA-SW-01	09/14/2018	0.66	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAB-SW-01	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAB-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAC-SW-01	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAC-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAD-SW-01	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAD-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAE-SW-01	09/14/2018	0.99	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAE-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	0.5	U
	OL-RAE-SW-03	09/14/2018	2.31	ug/L	0.5	U	0.5	U	0.5	U	0.5	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.5
(Continued)
VOC and SVOC Results for 2018 Surface Water Compliance Sampling

Period	Location	Sample Date	Sample Depth (ft)	Units	FLUORENE		NAPHTHALENE		PHENANTHRENE		PHENOL		PYRENE	
Surface Water Quality Standards/Guidance Values				ug/L	**0.54** [1]		**13** [1]		**5** [1]		**5**		**4.6** [1]	
Pre-Turnover	North Deep	09/14/2018	6.6	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	South Deep	09/14/2018	6.6	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAA-SW-01	09/14/2018	0.66	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAB-SW-01	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAB-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAC-SW-01	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAC-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAD-SW-01	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAD-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAE-SW-01	09/14/2018	0.99	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAE-SW-02	09/14/2018	1.65	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U
	OL-RAE-SW-03	09/14/2018	2.31	ug/L	0.5	U	0.5	U	0.5	U	2	U	0.5	U

1. Lowest SWQS as presented on Table 5.1 of the OLMMP.
U: not detected at specified reporting limit
J: estimated concentration

Table 4.6
Summary of Total PCB Results for 2018 Surface Water Compliance Sampling (ng/L)

Period	Location	Sample Date	Sample Depth (ft)	No. of Congeners Sampled For	Total No. of Congeners Detected	Total PCBs
Pre-Turnover	DEEP_N	9/14/2018	6.6	168	18	0.36
	DEEP_S	9/14/2018	6.6	168	19	0.54
	OL-RAA-SW-01	9/14/2018	0.66	168	15	0.36
	OL-RAB-SW-01	9/14/2018	1.65	168	15	0.33
	OL-RAB-SW-02	9/14/2018	1.65	168	10	0.17
	OL-RAC-SW-01	9/14/2018	1.65	168	17	0.36
	OL-RAC-SW-02	9/14/2018	1.65	168	34	1.19
	OL-RAD-SW-01	9/14/2018	1.65	168	8	0.13
	OL-RAD-SW-02	9/14/2018	1.65	168	8	0.15
	OL-RAE-SW-01	9/14/2018	0.99	168	33	1.14
	OL-RAE-SW-02	9/14/2018	1.65	168	24	0.90
	OL-RAE-SW-03	9/14/2018	2.31	168	36	2.60
Post-Turnover	DEEP_N	11/8/2018	6.6	168	28	1.07
	DEEP_S	11/8/2018	6.6	168	28	1.06
	OL-RAA-SW-01	11/8/2018	1.65	168	17	0.39
	OL-RAB-SW-01	11/8/2018	1.65	168	26	0.83
	OL-RAB-SW-02	11/8/2018	0.99	168	22	0.63
	OL-RAC-SW-01	11/8/2018	1.65	168	27	0.90
	OL-RAC-SW-02	11/8/2018	1.65	168	23	0.82
	OL-RAD-SW-01	11/8/2018	1.65	168	24	0.86
	OL-RAD-SW-02	11/8/2018	1.65	168	23	0.72
	OL-RAE-SW-01	11/8/2018	1.65	168	21	0.62
	OL-RAE-SW-02	11/8/2018	1.65	168	30	1.08
	OL-RAE-SW-03	11/8/2018	1.65	168	52	5.44

Notes:
1. When calculating Total PCBs, ND=0
2. Goals for PCB concentration of 0.12 ng/L for the Protection of Wildlife and 0.001 ng/L for the protection of human health via fish consumption.

Table 4.7
Summary of Total PCB Concentrations in 2017 and 2018

Total PCBs in Onondaga Lake (ng/L)				
Location	2017		2018	
	Pre	Post	Pre	Post
DEEP_N	0.46	1.16	0.36	1.07
DEEP_S	0.44	1.93	0.54	1.06
OL-RAA-SW-01	0.97	0.43	0.36	0.39
OL-RAB-SW-01	0.93	1.62	0.33	0.83
OL-RAB-SW-02	0.74	0.83	0.17	0.63
OL-RAC-SW-01	0.43	1.76	0.36	0.90
OL-RAC-SW-02	1.77	1.27	1.19	0.82
OL-RAD-SW-01	0.67	1.64	0.13	0.86
OL-RAD-SW-02	0.44	2.01	0.15	0.72
OL-RAE-SW-01	0.75	1.10	1.14	0.62
OL-RAE-SW-02	1.31	2.47	0.90	1.08
OL-RAE-SW-03	4.91	1.17	2.60	5.44
Average	1.15	1.45	0.69	1.20

Notes:
1. When calculating Total PCBs, ND=0
2. Goals for PCB concentration of 0.12 ng/L for the Protection of Wildlife and 0.001 ng/L for the protection of human health via fish consumption

Table 5.1
2018 Sediment Trap Slurry Mercury and Solids Content Results

Site	Trap Deploy Date	Trap Recover Date	Deployment Duration (Days)	Sample Volume (mL)	Slurry Mercury Results (µg/L)	TSS (mg/L)	TSS FD (mg/L)	TSS FD2 (mg/L)	TSS Average (mg/L)	TSS Deposition (mg per m2 per day)	Mercury Concentration[1,2] (mg/kg)	Mercury Deposition (µg per m^2 per day)
SD	05/08/18	05/16/18	8	157	0.27	1504	1291	1148	1314	5686	0.21	1.17
SD	05/16/18	05/21/18	5	164	-	2460	2572	2264	2432	17584	-	-
SD	05/21/18	05/29/18	8	150	0.21	4364	3276	3552	3731	15420	0.06	0.87
SD	05/29/18	06/06/18	8	146	-	2336	1728	2100	2055	8266	-	-
SD	06/06/18	06/12/18	6	141	0.29	1552	1008	1300	1287	6665	0.23	1.50
SD	06/12/18	06/19/18	7	141	-	1928	2120	1868	1972	8756	-	-
SD	06/19/18	06/26/18	7	136	0.19	1792	1828	1704	1775	7600	0.11	0.81
SD	06/26/18	07/02/18	6	148	-	2824	2544	2976	2781	15123	-	-
SD	07/02/18	07/10/18	8	165	0.11	2572	2464	2552	2529	11500	0.04	0.50
SD	07/10/18	07/17/18	7	134	-	4076	3672	3000	3583	15118	-	-
SD	07/17/18	07/24/18	7	127	0.18	2392	1840	1960	2064	8255	0.09	0.72
SD	07/24/18	07/31/18	7	143	-	1292	1628	1464	1461	6581	-	-
SD	07/31/18	08/07/18	7	153	0.12	2116	1360	1960	1812	8730	0.07	0.58
SD	08/07/18	08/16/18	9	140	-	2444	2244	2848	2512	8614	-	-
SD	08/16/18	08/21/18	5	145	0.09	1532	1500	-	1516	9691	0.06	0.58
SD	08/21/18	08/28/18	7	142	0.18	1276	1580	1304	1387	6201	0.13	0.80
SD	08/28/18	09/05/18	8	135	0.20	2452	2160	2448	2353	8754	0.08	0.74
SD	09/05/18	09/11/18	6	125	0.48	1708	1544	1836	1696	7789	0.28	2.20
SD	09/11/18	09/18/18	7	143	0.23	1484	1548	1412	1481	6671	0.16	1.04
SD	09/18/18	09/27/18	9	133	0.38	2140	2448	2356	2315	7540	0.16	1.24
SD	09/27/18	10/02/18	5	125	0.28	888	948	784	873	4813	0.32	1.54
SD	10/02/18	10/09/18	7	138	0.25	1140	1032	1008	1060	4606	0.24	1.09
SD	10/09/18	10/16/18	7	121	0.71	3012	2544	2740	2765	10537	0.26	2.71
SD	10/16/18	10/24/18	8	109	2.49	9584	8936	9544	9355	28096	0.27	7.48
SD	10/24/18	10/30/18	6	103	1.32	7688	6188	6448	6775	25636	0.19	5.00
SD	10/30/18	11/07/18	8	126	1.74	6804	5344	4860	5669	19683	0.31	6.04
SD	11/07/18	11/19/18	12	123	4.27	17992	14700	12932	15208	34362	0.28	9.65
South Deep Arithmetic Mean			-	-	-	-	-	-	-	11788	0.18	2.31

Legend: SD - South Deep, TSS - total suspended solids.

Notes: 1 - Mercury concentration = slurry mercury average divided by TSS average times a unit conversion of 1,000. Concentrations are based on dry weight. Calculations of TSS and mercury deposition include the surface area of the sediment traps (45 square centimeters).

2 - Solids and mercury deposition from June through September averaged 8,974 mg per square meter per day and 0.97 micrograms per square meter per day, respectively. June through September is when the sediment traps are below the thermocline and not subject to mixing within upper waters.

Table 5.2
2014 and 2017 SMU 8 Mercury Concentrations Including Comparison of Predicted and Actual 2017 SMU 8 Surface (0 to 4 cm) Sediment Mercury Concentrations

Location ID (North to South)	Measured 2014 Sediment Concentration (mg/kg)		Measured 2017 Sediment Concentration (mg/kg)		2017 Model Predicted Value (mg/kg)
	0 to 4 cm	4 to 10 cm	0 to 4 cm	4 to 10 cm	0 to 4 cm
North Basin					
OL-STA-80068	NA	NA	0.57	1.19	1
OL-STA-80069	0.71	1.2	0.66	1.23	1.1
OL-STA-80225	0.65	1.1	0.70	1.06	NA
OL-VC-80157	0.66	1.48	0.58	1.16	1.1
Ninemile Creek Outlet Area					
OL-STA-80073	0.87	1.5	0.44	1.09	1.4
OL-STA-80226	0.94	1.5	1.12	1.29	NA
OL-STA-80227	1.2	1.5	0.78	1.40	NA
Saddle					
OL-STA-80075	0.69	1.2	0.55	0.98	1.5
OL-STA-80103	0.96	1.95	0.62	1.39	1.4
OL-STA-80234	0.69	1.4	1.04	2.26	NA
South Basin					
OL-STA-80076	0.93	0.81	0.57	1.4	1.4
OL-STA-80078	1	1.7	0.80	0.93	1.5
OL-STA-80080	0.8	1.75	0.91	1.43	1.4
OL-STA-80082	0.94	1.6	0.81	1.66	1.5
OL-STA-80084	1.15	1.1	0.82	1.66	1.5
OL-STA-80229	0.82	1.3	0.70	1.46	NA
South Corner					
OL-STA-80085	1.26	1.6	0.50	1.01	1.9
OL-STA-80236	NA	NA	1.40	2.01	NA
OL-STA-80237	NA	NA	0.41	0.23	NA
OL-STA-80238	NA	NA	0.44	2.55	NA
OL-VC-80172	1.2	1.8	1.07	1.36	1.8
OL-VC-80177	1.25	1.7	0.69	1.45	1.9

Notes:

1 - Sediment concentrations are in milligrams per kilogram (mg/kg). For the 2014 event, concentrations are averages of data from the 0 to 2 cm and 2 to 4 cm intervals

2 - The MNR model in the design (Parsons et al. 2012) simulates surface mercury concentrations at specific SMU 8 locations. For locations not included in the final design, an NA is indicated.

3 - Predicted concentration ranges are based on the MNR model applied in the design for two different sedimentation rates and a four centimeter mixing depth.

Table 5.3

Percent Reductions in SMU 8 Surface Sediment Mercury Concentration from PDI to 2017

Sub-basin	Percent Reduction
North Basin	37%
Ninemile Creek Outlet Area	61%
Saddle	49%
South Basin	55%
South Corner	60%

Table 5.4
Surface Sediment Area-Weighted Average Mercury Concentration

Sub-Basin	Surface Sediment Area-Weighted Average Mercury Concentration (mg/kg)	
Sub-basin	**Method 1**	**Method 2**
North Basin	0.75	0.80
Ninemile Creek Outlet Area	0.51	0.46
Saddle	0.67	0.58
South Basin	0.70	0.64
South Corner	0.41	0.45

Table 5.5
Summary of SMU 8 Frozen Core Observations (2014, 2015 and 2017)

Locataion	Water Depth (ft)	Year	Depth to First Varve / Layer (cm) Based on Observations of Frozen Cores	Depth to Sand Microbead Marker (cm)[1]	Approximate Sedimentation Rate based on microbead depth (cm per year)	Approximate Sedimentation Rate based on microbead depth (g per cm^2 per year)
North Basin						
OL-MB-80094-14-01	54	2014	0.5	NA	NA	NA
OL-MB-80069-14-01	51	2014	7	7	1	0.24
OL-MB-80094-15-01	50.3	2015	NA	2.7	0.45	0.11
OL-MB-80094-15-02	50.3	2015	NA	2-7.5[3]	0.33, 1.25	0.08, 0.30
East-01-10-15	32.7	2015	4	NA	NA	NA
East-01-13-15	43.4	2015	1.5	NA	NA	NA
East-01-15-15	49.1	2015	1.5	NA	NA	NA
East-01-DEEP-15	59.3	2015	2.5	NA	NA	NA
OL-MB-80093-A	47	2017	0.4	3.5	0.44	0.11
OL-MB-80093-B	45	2017	1	1.5	0.19	0.05
OL-MB-80094-A	56	2017	2.5	3	0.38	0.09
OL-MB-80094-B	56	2017	0.7	1.2	0.15	0.04
OL-MB-80095-A	65	2017	1	2.5	0.31	0.08
OL-MB-80095-B	68.2	2017	0.1	2.5	0.31	0.08
OL-MB-80096-A	57	2017	0.1	3.7	0.46	0.11
OL-MB-80096-B	57.8	2017	0.2	6	0.75	0.18
South Basin						
OL-MB-80098-14-01	62	2014	1.75	NA	NA	NA
OL-MB-80101-14-01	49	2014	1	NA	NA	NA
OL-MB-80101-15-01	48.3	2015	NA	6-6.5	1.0, 1.1	0.24, 0.26
OL-MB-80101-15-02	48.1	2015	NA	7.5-8[3]	1.25, 1.33	0.30, 0.32
OL-MB-80098-15-01	61.6	2015	NA	8-9.5[3]	1.33, 1.58	0.32, 0.38
OL-MB-80098-15-02	61.2	2015	NA	3	0.50	0.12
WB1-8-02-10-15	32.3	2015	4	NA	NA	NA
WB1-8-02-13-15	44.8	2015	4	NA	NA	NA
WB1-8-02-15-15	49.9	2015	3	NA	NA	NA
WB1-8-02-DEEP-15	62.7	2015	2.5	NA	NA	NA
RAD-D-03-10-15	31.4	2015	2	NA	NA	NA
RAD-D-03-13-15	42.2	2015	2	NA	NA	NA
RAD-D-03-15-15	49.2	2015	1	NA	NA	NA
OL-MB-80097-A	66	2017	3	4.5	0.56	0.14
OL-MB-80097-B	66	2017	1	4.3	0.54	0.13
OL-MB-80098-A	64	2017	1	6.7	0.84	0.20
OL-MB-80098-B	63.6	2017	0.2	5.5	0.69	0.17
OL-MB-80099-A	68	2017	0.1	6	0.75	0.18
OL-MB-80099-B	68.7	2017	0.1	6.5, 10.4[4]	0.81, 1.30	0.20, 0.32
OL-MB-80100-A	61.4	2017	0.1	8	1.00	0.24
OL-MB-80100-B	60.5	2017	0.1	5.8	0.73	0.18
OL-MB-80101-A	56	2017	0.4	7, 7.4 [4]	0.88, 0.93	0.21, 0.22
OL-MB-80101-B	56	2017	0.1	7.5	0.94	0.23

Notes:
1 - 1 centimeter = 0.033 ft.
2 - The sand microbead marker was placed at nine localized SMU 8 plots in late June 2009.
3 - The core tube likely entered the sediment at an angle and, therefore, the depth of the accumulated sediment above the microbeads is uncertain.

Table 5.6

Average Mid-May to Mid-November 2014-2018 Solids Deposition at The South Deep Location in Onondaga Lake Based on Sediment Trap Results

Year	Number of Sediment Traps Deployed with Mercury Measured in Settling Sediment	Average Solids Deposition/Settling Rate (milligrams per square meter per day)	Average Mercury Concentration in Settling Sediment (mg/kg or part per million)
2014	19	17,800	0.91
2015	20	13,200	0.44
2016	20	9,812	0.49
2017	21	11,494	0.21
2018	20	11,788	0.18

Notes:

1 - Each sediment trap was typically deployed for seven days.

2 - Average solids deposition from June through September when traps are below the thermocline as follows for 2014-2017, respectively: 15,000, 11,633, 8,745, 10,817, and 8,974 milligrams per square meter per day.

Table 5.7
June 2015 SMU 8 Benthic Macroinvertebrate Sampling Results

Summary based on Sort 1 (pick until 100 organisms encountered or entire sample picked)

Site	**East-01**															
Location	**East-01-10-15**				**East-01-13-15**				**East-01-15-15**				**East-01-DEEP-15**			
Water Depth (m)	**10.1**				**13.1**				**15.5**				**18**			
Taxa / Replicate	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**
Amphipod		1		**1**				**0**				**0**				**0**
Arachnid (water mite)		1		**1**				**0**				**0**				**0**
Chironomid	8	9	9	**26**	13	25	22	**60**	1	1		**2**	1			**1**
Mollusk (bivalve)				**0**				**0**				**0**				**0**
Dreissenid mussel	2	2		**4**				**0**				**0**				**0**
Oligochaete	8	12	3	**23**	15	10	46	**71**	30	5	1	**36**		2		**2**
Total number of individuals	18	25	12	**55**	28	35	68	**131**	31	6	1	**38**	1	2	0	**3**
Number per square meter	775	1076	517	**789**	1205	1507	2927	**1880**	1334	258	43	**545**	43	86	0	**43**

Site	**RAD-D**											
Location	**RAD-D-03-10-15**				**RAD-D-03-13-15**				**RAD-D-03-15-15**			
Water Depth (m)	**9.4**				**12.8**				**14.9**			
Taxa / Replicate	**1***	**2***	**3***	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3***	**SUM**
Amphipod				**0**				**0**				**0**
Arachnid (water mite)				**0**				**0**				**0**
Chironomid		2		**2**		1	2	**3**	2	1	2	**5**
Mollusk (bivalve)			1	**1**				**0**				**0**
Dreissenid mussel			2	**2**				**0**				**0**
Oligochaete	100	98	97	**295**	78	61	11	**150**	45	34	98	**177**
Total number of individuals	100	100	100	**300**	78	62	13	**153**	47	35	100	**182**
Number per square meter	4305	4305	4305	**4305**	3358	2669	560	**2195**	2023	1507	4305	**2612**

Site	**WB1-8**															
Location	**WB1-8-02-10-15**				**WB1-8-02-13-15**				**WB1-8-02-15-15**				**WB1-8-02-DEEP-15**			
Water Depth (m)	**9.8**				**13.4**				**15.2**				**19.2**			
Taxa / Replicate	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**
Amphipod	1		1	**2**				**0**				**0**				**0**
Arachnid (water mite)				**0**				**0**				**0**				**0**
Chironomid	15	9	13	**37**	16	23	21	**60**	1	6	6	**13**	3			**3**
Mollusk (bivalve)	1	2		**3**	1			**1**				**0**				**0**
Dreissenid mussel	1	2	1	**4**		2	1	**3**				**0**				**0**
Oligochaete	7	5	11	**23**	41	7	8	**56**	16	4	39	**59**	32	8	39	**79**
Total number of individuals	25	18	26	**69**	58	32	30	**120**	17	10	45	**72**	35	8	39	**82**
Number per square meter	1076	775	1119	**990**	2497	1378	1291	**1722**	732	430	1937	**1033**	1507	344	1679	**1177**

Notes:

1 - Collected June 11, 2015 (hypolimnion did not go hypoxic until early July based on data from UFI buoy)

2 - All collected with Petite Ponar (36 square inches; 0.02323 square meters)

3 - RAD-D (9.4 m) rep 1: 29/30 grids sampled; rep 2: 27/30 grids sampled; rep 3: 20/30 grids sampled; RAD-D (14.9 m) rep 3: 29/30 grids sampled

* Replicates where 100 individuals were removed prior to whole sample being picked; number per square meter is biased low.

Table 5.8
August 2015 SMU 8 Benthic Macroinvertebrate Sampling Results

Summary based on Sort 1 (pick until 100 organisms encountered or entire sample picked)

Site

	East-01															
Location	**East-01-10-15**				**East-01-13-15**				**East-01-15-15**				**East-01-DEEP-15**			
Water Depth (m)	**10.1**				**13.1**				**15.5**				**18**			
Taxa Replicate	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**
Arachnid (water mite)													1		1	**2**
Chironomid	4	3	6	**13**	13	10	10	**33**	1	2	2	**5**	1		1	**2**
Lepidoptera							1	**1**								
Mollusk (bivalve)	4			**4**												
mussel			1	**1**		1		**1**			1	**1**	1		1	**2**
Oligochaete	15	23	28	**66**	60	28	20	**108**	23	13	3	**39**	7	12	2	**21**
Total number of individuals	23	26	35	**84**	73	39	31	**143**	24	15	6	**45**	10	12	5	**27**
Number per square meter	990	1119	1507	**1205**	3142	1679	1334	**2052**	1033	646	258	**646**	430	517	215	**387**

	RAD-D												**WB1-8**															
Location	**RAD-D-03-10-15**				**RAD-D-03-13-15**				**RAD-D-03-15-15**				**WB1-8-02-10-15**				**WB1-8-02-13-15**				**WB1-8-02-15-15**				**WB1-8-02-DEEP-15**			
Water Depth (m)	**9.4**				**12.8**				**14.9**				**9.8**				**13.4**				**15.2**				**19.2**			
Taxa Replicate	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**	**1**	**2**	**3**	**SUM**
Arachnid (water mite)																												
Chironomid						1		**1**		1		**1**		4	2	**6**	11	4	9	**24**	6	4	6	**16**				
Lepidoptera																												
Mollusk (bivalve)																												
mussel		1		**1**											1	**1**							1	**1**		1		**1**
Oligochaete	55	22	34	**111**	8	26	44	**78**			82	**82**	2	19	22	**43**	17	93	10	**120**	6	3		**9**	5	3		**8**
Total number of individuals	55	23	34	**112**	8	27	44	**79**	0	1	82	**83**	2	23	25	**50**	28	97	19	**144**	12	7	7	**26**	5	4	0	**9**
Number per square meter	2368	990	1464	**1607**	344	1162	1894	**1134**	0	43	3530	**1191**	86	990	1076	**717**	1205	4176	818	**2066**	517	301	301	**373**	215	172	0	**129**

Notes:

1. Collected August 24 and 25, 2015 (hypolimnion went hypoxic in early July based on data from UFI buoy)

2. All collected with Petite Ponar (36 square inches; 0.02323 square meters)

Table 6.1
2018 Cap Thickness Measurements

					Design[2]/Target[3] Thickness (inches)				Measured Thickness (inches)										
Rem. Area		Zone[1]	Location ID	Cap Type	Habitat Layer	Erosion Protection Layer[4]	Chemical Isolation Layer	Total	Core A Thickness					Core B Thickness					Comment
									Habitat Layer	Chemical Isolation Layer	Total	Overlying Sediment	Native Plug (Y/N)[5]	Habitat Layer	Chemical Isolation Layer	Total	Overlying Sediment	Native Plug (y/n)[5]	
Remediation Area B	RA-B-1C (4 - 10 ft of Water)	2	OL-RAB-0008	MPC-Multilayer	12 / 9		9	**21 / 18**	10	17	**27**	**0**	**Y**	10	16	**26**	**0**	**Y**	
	RA-B-1C (4 - 10 ft of Water)	2	OL-RAB-0020	MPC-Multilayer	12 / 9		9	**21 / 18**	9	4	**13**	**0**	**Y**	7	20	**27**	**0**	**Y**	
	RA-B-1C (4 - 10 ft of Water)	2	OL-RAB-0024	MPC-Multilayer	12 / 9		9	**21 / 18**	9	13	**22**	**0**	**Y**	8	12	**20**	**0**	**Y**	
	RA-B-1C (4 - 10 ft of Water)	2	OL-RAB-0025	MPC-Multilayer	12 / 9		9	**21 / 18**	7	17	**24**	**0**	**Y**	4	14	**18**	**0**	**Y**	
	RA-B-1D (4 - 10 ft of Water)	2	OL-RAB-0021	MPC-Multilayer	12 / 9		4.5	**16.5 / 13.5**	3	10	**13**	**0.5**	**Y**	5	12	**17**	**1**	**Y**	
	RA-B-1D (4 - 10 ft of Water)	2	OL-RAB-0022	MPC-Multilayer	12 / 9		4.5	**16.5 / 13.5**	6	23+	**29+**	**0**	**N**	8	12	**20**	**0**	**Y**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0023	MPC-Multilayer	12 / 9		12	**24 / 21**	6	16	**22**	**0**	**Y**	9	16	**25**	**0**	**Y**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0026	MPC-Multilayer	12 / 9		12	**24 / 21**	6	8+	**14+**	**0**	**N**	5	20	**25**	**0**	**Y**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0016	MPC-Multilayer	12 / 9		12	**24 / 21**	6	15	**21**	**0**	**Y**	6	17	**23**	**0**	**Y**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0016C	MPC-Multilayer	12 / 9		12	**24 / 21**	16	15	**31**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0016D	MPC-Multilayer	12 / 9		12	**24 / 21**	5	19+	**24+**	**0**	**N**	NA	NA	**NA**	**NA**	**NA**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0016E	MPC-Multilayer	12 / 9		12	**24 / 21**	8	12	**20**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0016F	MPC-Multilayer	12 / 9		12	**24 / 21**	5	18	**23**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-B-1E (4 - 10 ft of Water)	2	OL-RAB-0016N	MPC-Multilayer	12 / 9		12	**24 / 21**	7.5	12.5	**20**	**0**	**Y**	7	18	**25**	**0**	**Y**	
Remediation Area C	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	3.5	13.5	**17**	**0**	**Y**	4	10	**14**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007C	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	8	14	**22**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007D	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	12	11	**23**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007E	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	5	11	**16**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007F	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	0	17	**17**	**1**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007F Retake	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	0	15	**15**	**0**	**Y**	0	13	**13**	**0.5**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007N	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	7	13	**20**	**0**	**Y**	8	12	**20**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0007S	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	7	8	**15**	**0**	**Y**	4	8	**12**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0024	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	4	8	**12**	**0.5**	**Y**	4	3	**7**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0025	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	7	7	**14**	**0**	**Y**	6	4	**10**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0026	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	6	8	**14**	**0**	**Y**	10	2	**12**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0027	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	0	11	**11**	**0.5**	**Y**	0	18	**18**	**0.5**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0027 Retake	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	2	9	**11**	**0**	**Y**	3	10	**13**	**0.25**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0028	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	4	11	**15**	**0**	**Y**	6	7	**13**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0029	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	8	8	**16**	**1.5**	**Y**	7	7+	**14+**	**1.5**	**N**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0030	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	4	10+	**14+**	**0**	**N**	5	12	**17**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0031	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	8	6	**14**	**1**	**Y**	7	10	**17**	**1**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0032	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	7	16	**23**	**0**	**Y**	7	13	**20**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0033	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	10	13+	**23+**	**0**	**N**	8	11	**19**	**0**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0034	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	10	26	**36**	**2**	**Y**	8	11	**19**	**1.5**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0035	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	9	9	**18**	**3**	**Y**	9	10	**19**	**2**	**Y**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0036	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	2	12	**14**	**0.5**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0037	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	3	9	**12**	**0.25**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	RA-C-2A (4 - 10 ft of Water)	2	OL-RAC-0038	MPC-Multilayer	10 / 7		4.5	**14.5 / 11.5**	5	11	**16**	**2.5**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	C3	2	OL-RAC-0022	Multilayer	18 / 9		12	**30 / 21**	13	23+	**36+**	**0**	**N**	14	19.5+	**33.5+**	**0**	**N**	

Table 6.1
(Continued)
2018 Cap Thickness Measurements

					Design[2]/Target[3] Thickness (inches)				Measured Thickness (inches)										
Rem. Area		Zone[1]	Location ID	Cap Type	Habitat Layer	Erosion Protection Layer[4]	Chemical Isolation Layer	Total	Core A Thickness					Core B Thickness					Comment
									Habitat Layer	Chemical Isolation Layer	Total	Overlying Sediment	Native Plug (Y/N)[5]	Habitat Layer	Chemical Isolation Layer	Total	Overlying Sediment	Native Plug (y/n)[5]	
Remediation Area D	D-Center	2	OL-RAD-0017	Multilayer	12 / 9		12	**24 / 21**	11	19	**30**	**0**	**Y**	9	20.5	**29.5**	**0**	**Y**	
	D-Center	2	OL-RAD-0018	Multilayer	12 / 9		12	**24 / 21**	12	13	**25**	**0**	**Y**	10	12	**22**	**0**	**Y**	
	D-Center	2	OL-RAD-0026	Multilayer	12 / 9		12	**24 / 21**	13	13	**26**	**0**	**Y**	11.5	13.5	**25**	**0**	**Y**	
	D-Center	2	OL-RAD-0026 Recoring	Multilayer	12 / 9		12	**24 / 21**	12	18	**30**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	D-Center	2	OL-RAD-0029	Multilayer	18 / 9		12	**30 / 21**	14	17	**31**	**0**	**Y**	14	18	**32**	**0**	**Y**	
	D-Center	2	OL-RAD-0049	Multilayer	12 / 9		12	**24 / 21**	28	1+	**29+**	**0.5**	**N**	28	1+	**29+**	**1.5**	**N**	
	D-Center	2	OL-RAD-0050	Multilayer	12 / 9		12	**24 / 21**	21	21+	**42+**	**3**	**N**	31	2+	**22+**	**3**	**N**	
	D-West	2	OL-RAD-0022	Multilayer	18 / 9		12	**30 / 21**	12	15	**27**	**0**	**Y**	12	13.5	**25.5**	**0**	**Y**	
	D-West	2	OL-RAD-0022 Recoring	Multilayer	18 / 9		12	**30 / 21**	16	20	**36**	**0**	**Y**	14	18	**32**	**0**	**Y**	
	OL-VC-10138/40	2	OL-RAD-0024	Multilayer	12 / 9		12	**24 / 21**	10.5	22.5	**33**	**0**	**Y**	14	12+	**26+**	**0**	**N**	
	OL-VC-10138/40	2	OL-RAD-0048	Multilayer	18 / 9		12	**30 / 21**	31	11+	**42+**	**0**	**N**	30	20+	**50+**	**0**	**N**	
	D-East	1	OL-RAD-0047	Multilayer	12 / 9		12	**24 / 21**	NA	45	**45**	**2**	**Y**	NA	46	**46**	**2**	**Y**	
Remediation Area E	E-2	2	OL-RAE-0040	Multilayer	12 / 9		12	**24 / 21**	14	26	**40**	**0**	**Y**	12	27	**39**	**0**	**Y**	
	E-3	2	OL-RAE-0023	Multilayer	12 / 9		12	**24 / 21**	29	22	**51**	**0**	**Y**	15	17	**32**	**0**	**Y**	
	E-3	2	OL-RAE-0023 Recoring	Multilayer	12 / 9		12	**24 / 21**	25	17	**42**	**0**	**Y**	NA	NA	**NA**	**NA**	**NA**	
	E-3	2	OL-RAE-0029	Multilayer	12 / 9		12	**24 / 21**	14.5	15.5	**30**	**0**	**Y**	14	15	**29**	**3**	**Y**	
	E-3	2	OL-RAE-0029 Recoring	Multilayer	12 / 9		12	**24 / 21**	41+		**41+**	**0**	**N**	NA	NA	**NA**	**NA**	**NA**	
	MERC[6]	NA	OL-RAE-0047	Monolayer	NA		NA	**6**	NA	11	**11**	**1**	**Y**	NA	10	**10**	**0**	**Y**	
	MERC[6]	NA	OL-RAE-0048	Monolayer	NA		NA	**6**	NA	7	**7**	**2**	**Y**	NA	11	**11**	**1**	**Y**	

Measured thickness is less than the minimum target thickness specified in the OLMMP.

[1] The coarsest substrates in Zones 1, 2, and 3 are sand, fine gravel and coarse gravel/cobble, respectively.
[2] Design thickness specified as a minimum.
[3] Listed thickness is the target minimum thickness specified in the OLMMP
[4] When the habitat and erosion protection layer are the same substrate, the total thickness of this habitat/erosion protection layer is listed under the habitat layer.
[5] The presence of a plug of native sediment in the bottom of the core indicates the core fully penetrated the cap material, allowing measurement of the total cap thickness.
[6] Design thickness for MERC monolayer caps is specified as an average thickness over the cap area.
NA - Not applicable

Table 6.2
2018 Chemical Monitoring Results

			Rem Area B			Rem Area C			Rem Area D			Rem Area E		
Parameter Name	**Units**	**Cap Criteria**	**# Samples/ # Detects**	**# Exceedances**	**Mean[1]**	**# Samples/ # Detects**	**# Exceedances**	**Mean[1]**	**# Samples/ # Detects**	**# Exceedances**	**Mean[1]**	**# Samples/ # Detects**	**# Exceedances**	**Mean[1]**
PAHS														
ACENAPHTHENE	ug/kg	861	4/0	0	0.0	2/0	0	0.0	10/0	0	0.0	6/0	0	0.0
ACENAPHTHYLENE	ug/kg	1301	4/0	0	0.0	2/0	0	0.0	10/0	0	0.0	6/0	0	0.0
ANTHRACENE	ug/kg	207	4/0	0	0.0	2/0	0	0.0	10/0	0	0.0	6/0	0	0.0
FLUORENE	ug/kg	264	4/0	0	0.0	2/0	0	0.0	10/0	0	0.0	6/0	0	0.0
NAPHTHALENE	ug/kg	917	4/0	0	0.0	2/0	0	0.0	17/0	0	0.0	18/0	0	0.0
PHENANTHRENE	ug/kg	543	4/0	0	0.0	2/0	0	0.0	10/0	0	0.0	6/0	0	0.0
VOCS														
BENZENE	ug/L	760	4/0	0	0.0	2/1	0	0.11	17/0	0	0.0	18/0	0	0.0
TOLUENE	ug/L	480	4/2	0	0.3	2/1	0	27.5	17/5	1	101.3	18/3	1	78.2
ETHYLBENZENE	ug/kg	176	4/0	0	0.0	2/0	0	0.0	17/0	0	0.0	18/0	0	0.0
XYLENES, TOTAL	ug/kg	560.8	4/0	0	0.0	2/0	0	0.0	17/0	0	0.0	18/0	0	0.0
CHLOROBENZENE	ug/kg	428	4/0	0	0.0	2/0	0	0.0	17/0	0	0.0	18/1	0	0.0
DICHLOROBENZENES	ug/kg	239	4/0	0	0.0	2/0	0	0.0	17/0	0	0.0	18/0	0	0.0
TRICHLOROBENZENES	ug/kg	347	4/0	0	0.0	2/0	0	0.0	17/0	0	0.0	18/0	0	0.0
Other														
MERCURY	mg/kg	2.2	4/0	0	0.0	1/0	0	0.0	11/0	0	0.0	6/0	0	0.0
PHENOL	ug/L	250	4/2	0	3.0	2/1	0	11.5	10/5	0	6.9	6/2	0	7.7

Note:
[1]Non-detects set to zero

Table 6.3
2018 Summary of pH in Model Areas Where Siderite Was Placed

	Isolation Layer			Habitat Layer		
Remediation Area	**# Samples**	**# Samples With pH > 8**	**Mean**	**# Samples**	**# Samples With pH > 8**	**Mean**
Rem Area B	2	1	8.5	0	0	NA
Rem Area C	2	1	8.3	1	1	8.1
Rem Area D	7	3	7.8	9	3	7.8
Rem Area E	3	0	7.2	0	0	NA

Table 7.1
Median Turbidity Results by Station for Each Month of Baseline Monitoring Along Wastebeds 1-8 Shoreline (2012 Values In Parentheses)

Station Number	Sept. 2017	Oct. 2017	Nov. 2017	Sept.-Nov. 2017
1	1.3 (1.2)	2.5 (3.2)	4.2 (1.8)	2.6 (1.7)
2	3.6 (2.5)	2.0 (2.9)	3.4 (1.8)	2.9 (2.4)
3	3.1 (4.1)	3.0 (4.6)	4.0 (2.9)	3.2 (3.8)
South Deep	2.5 (2.6)	2.3 (3.1)	5.7 (3.0)	2.8 (2.8)

Note: Results are presented in Nephelometric turbidity units (NTUs).

Table 8.1
2018 Nitrate Addition Summary

Date/Location[1]	Metric Tons (as N) of CN-8 Applied[2]	Application Water Depth[3] (feet)	Dilution Water to CN-8 Volume Ratio[4]	Date/Location[1]	Metric Tons (as N) of CN-8 Applied[2]	Application Water Depth[3] (feet)	Dilution Water to CN-8 Volume Ratio[4]
June 12 / S1	1.89	62	409	August 15 / N	1.97	56	315
June 14 / S2	1.97	56	409	August 20 / N	1.97	56	310
June 18 / S1	1.13	56	371	August 21 / S2	1.63	56	319
June 19 / S1	0.84	56	416	August 24 / S1	1.97	58.5	332
June 20 / N	1.97	56	435	August 27 / S1	1.97	58.5	347
June 21 / S2	1.97	56	414	August 29 / N	1.97	56	305
June 25 / S1	1.97	56	436	August 30 / S2	1.97	56	319
June 26 / S2	1.79	56	452	September 4 / S1	1.97	59	320
June 27 / N	1.42	51	448	September 6 / N	1.97	51	288
June 28 / S1	1.94	56	461	September 7 / S2	1.86	56	301
July 2 / N	0.87	51	331	September 10 / S1	1.69	59	344
July 3 / S1	1.94	56	340	September 12 / N	1.97	54	381
July 9 / S1	1.91	56	334	September 13 / S2	1.97	56	391
July 11 / N	1.97	51	351	September 17 / S1	1.97	59	329
July 12 / S2	1.87	56	342	September 19 / N	1.95	55	354
July 16 / S1	1.93	56	323	September 20 / S2	1.93	55	368
July 18 / N	1.96	55	304	September 24 / S1	1.97	59	371
July 19 / S2	1.94	60	287	September 25 / N	1.97	56	432
July 23 / S1	1.37	60	355	September 27 / N	1.97	56	453
July 24 / S1	0.68	60	332	September 28 / S2	1.97	56	444
July 26 / N	1.94	52	307	October 1 / S1	1.69	59	440
July 30 / S1	1.94	57	312	October 2 / S2	1.75	56	493
August 1 / N	1.94	56	299	October 3 / N	1.75	56	541
Augst 2 / S2	1.94	57	316	October 4 / S1	1.58	59	562
August 6 / S1	1.97	56	303	October 8 / S1	1.24	59	682
August 8 / N	1.01	52	292	October 10 / N	1.86	56	718
August 9 / N	0.93	51	279	October 11 / S2	1.97	56	542
August 10 / S2	1.97	56	303	October 15 / S1	1.63	59	580
August 13 / S1	1.97	56	296	October 16 / N	1.55	56	650
August 14 / S2	1.97	56	302				

[1] S1 is the South Location 1, S2 is the South Location 2, and N is the North Location (Figure 1)
[2] 1 metric ton = 2,240 lbs
[3] Same as target depth presented in Table 2
[4] Same as dilution factor presented in Table 2

Table 8.2
Summary of 2017 Applications of Nitrate in Onondaga Lake

Date		6/12/2018 *	6/14/2018 *	6/18/2018 *	6/19/2018	6/20/2018	6/21/2018	6/25/2018	6/26/2018 *	6/27/2018 *	6/28/2018	7/2/2018
Location		South 1	South 2	South 1	South 1	North	South 2	South 1	South 2	North	South 1	North
Dilution Factor (epilimnion water flow divided by nitrate flow)		409	409	371	416	435	414	436	452	448	461	331
Nitrate Flow_gauge	gpm	9.00	9.00	9.00	8.50	8.00	8.50	8.25	8.00	8.00	8.00	9.00
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	7.20	7.20	7.20	6.80	6.40	6.80	6.60	6.40	6.40	6.40	7.20
Epilimion Water Flow_System A	gpm	2862	2858	2886	2834	2770	2810	2800	2800	2730	2960	2760
Epilimion Water Flow_System B	gpm	3031	3025	2458	2820	2800	2820	2950	2980	3000	2940	2000
Water temperature_epilimnion	degrees C	21.99	19.2	18	22.8	20.8	22.1	21.5	21.77	22	21.5	25.12
Conductance_epilimnion (field)	uS/cm	1877	1730	1862	1815	1735	1803	1775	1950	1933	1690	1800
Specific conductance_epilimnion (calc)	uS/cm	1991	1946	2149	1895	1886	1909	1902	2078	2050	1811	1796
Total Water Depth at Application Location	feet	65.08	65	64	63.5	59.1	64.3	63.8	64.5	59.5	63.75	58
Target Water Depth for Adding Nitrate	feet	62	56	56	56	56	56	56	56	51	56	51
Water Temperature _target depth	degrees C	8.29	6.8	10.2	9.7	9.6	9.4	9.1	9.01	8.86	10.5	9.2
Conductance _target depth (field)	uS/cm	1823	1827	1826	1815	1212	1235	1790	1825	1833	1480	1720
Specific Conductance _target depth (calc)	uS/cm	2678	2801	2546	2564	1717	1759	2571	2627	2650	2047	2463
Start time_dosing	24-hour clock	12:30	8:45	12:30	9:45	9:00	10:10	12:50	12:25	10:25	9:40	12:10
Start Volume_Tank A	gallons	2569	2569	2569	1316	2569	2569	2569	2569	2506	2538	2506
Start Volume_Tank B	gallons	2569	2569	2569	1316	2569	2569	2569	2569	2506	2538	2506
End Volume_Tank A	gallons	376	376	1315	376	376	376	376	251	924	376	1535
End Volume_Tank B	gallons	564	376	1316	376	376	376	376	909	924	376	1535
Total Volume of CN-8 Applied	gallons	4198	4386	2508	1880	4386	4386	4386	3979	3164	4324	1942
Total Mass of CN-8 Applied	lbs as nitrogen	4224	4413	2523	1891	4413	4413	4413	4003	3184	4350	1954
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 8.00 gpm, then adjusted to final	Started CN8 flowrate at 10.00 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 9.00 gpm, then adjusted to final	Started CN8 flowrate at 8.50 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 8.50 gpm, then adjusted to final	Started CN8 flowrate at 8.25 gpm, then adjusted to final	No chemical adjustments made	No chemical adjustments made	Started CN8 flowrate at 8.00 gpm, then adjusted to final
End Time_dosing	24-hour clock	17:45	13:45	14:30	11:50	15:00	15:20	17:00	17:00	14:40	15:25	14:40

Definitions:

1 CN-8: Liquid calcium nitrate provided by Yara Chemical. The density of CN-8 is 1.48 times the density of water.

2 Dilution factor is the ratio of dilution water flow from the lake epilimnion to flow of CN-8. The density of the water:CN-8 mixture varies daily with lake water temperature and salinity. Specific conductance values were measured to quantify salinity.

3 gpm: gallons per minute

4 uS/cm: Microsiemens per centimeter, or the unit of measure of specific conductance.

5 Start Volume and End Volume: Applies to CN-8.

6 Target Depth: The specific depth of release of the CN-8 as controlled by the length of individual hoses which were manually connected to the manifold prior to each application. Early on in the season the target depth identified by a height of 2-3m off of the bottom depending on what the specific water depth was at N, S1 or S2 on a given day. Where the target depths are not consistent with being 2 to 3 meters above the lake bottom, the target depths were based on monitoring within the hypolimnion at the N, S1 or S2 application locations and recent nitrate demand at each location.

7 MT NO3-N: Metric tons of nitrate-nitrogen. One metric ton is 1,000 kilograms or 2,240 pounds.

Table 8.2
(Continued)
Summary of 2017 Applications of Nitrate in Onondaga Lake

Date		7/3/2018	7/9/2018	7/11/2018 [2]	7/12/2018 [2]	7/16/2018 [2]	7/18/2018 [2]	7/19/2018	7/23/2018	7/24/2018	7/26/2018 [2]	7/30/2018
Location		South 1	South 1	North	South 2	South 1	North	South 2	South 1	South 1	North	South 1
Dilution Factor (epilimnion water flow divided by nitrate flow)		340	334	351	342	323	304	287	355	332	307	312
Nitrate Flow_gauge	gpm	10.50	10.50	10.00	10.50	11.25	11.75	11.50	10.00	10.00	11.75	11.50
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	8.40	8.40	8.00	8.40	9.00	9.40	9.20	8.00	8.00	9.40	9.20
Epilimion Water Flow_System A	gpm	2760	2953	2810	2970	2958	2825	2353	2795	2430	2949	2834
Epilimion Water Flow_System B	gpm	2950	2665	2800	2776	2850	2884	2926	2881	2875	2820	2904
Water temperature_epilimnion	degrees C	26	26.36	24.43	25.9	27.57	25.18	25.3	24.15	24.25	24.36	25.1
Conductance_epilimnion (field)	uS/cm	1796	1806	1793	1813	1814	1840	1840	1889	1870	1790	1809
Specific conductance_epilimnion (calc)	uS/cm	1762	1760	1813	1782	1729	1834	1830	1920	1897	1812	1806
Total Water Depth at Application Location	feet	64	63.9	58.9	64.7	64.5	59	64.5	63.5	63.5	59.75	64
Target Water Depth for Adding Nitrate	feet	56	56	51	56	56	55	60	60	60	52	57
Water Temperature _target depth	degrees C	9.1	8.99	10.5	9.23	8.84	9.56	8.81	9.02	9.25	9.54	9.1
Conductance _target depth (field)	uS/cm	1731	1752	1272	1750	1752	1739	1755	1740	1490	1747	1757
Specific Conductance _target depth (calc)	uS/cm	2486	2524	1759	2504	2534	2466	2541	2504	2131	2479	2523
Start time_dosing	24-hour clock	10:00	12:45	9:18	9:55	12:20	9:35	9:15	12:50	8:45	9:10	12:50
Start Volume_Tank A	gallons	2538	2538	2569	2475	2538	2569	2538	2569	1065	2538	2538
Start Volume_Tank B	gallons	2538	2538	2569	2444	2538	2538	2538	2569	1097	2538	2538
End Volume_Tank A	gallons	376	407	376	376	376	376	376	1034	376	376	376
End Volume_Tank B	gallons	376	407	376	376	407	376	376	1065	276	376	376
Total Volume of CN-8 Applied	gallons	4324	4261	4386	4167	4292	4355	4324	3039	1510	4324	4324
Total Mass of CN-8 Applied	lbs as nitrogen	4350	4287	4413	4192	4319	4382	4350	3058	1519	4350	4351
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 10.00 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 10.00 gpm, then adjusted to final	Started port CN8 flowrate at 10.50 gpm, then adjusted to final;Started starboard CN8 flowrate at 9.50 gpm, then adjusted to final	Started port CN8 flowrate at 11.00 gpm, then adjusted to final;Started starboard CN8 flowrate at 10.00 gpm, then adjusted to final	Started port CN8 flowrate at 10.50 gpm, then adjusted to final;Started starboard CN8 flowrate at 10.00 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 11.00 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 11.00 gpm, then adjusted to final	Started CN8 flowrate at 11.00 gpm, then adjusted to final
End Time_dosing	24-hour clock	14:30	17:00	13:55	14:55	16:40	13:55	13:15	15:45	10:15	13:09	16:52

Table 8.2
(Continued)
Summary of 2017 Applications of Nitrate in Onondaga Lake

Date		**8/1/2018**	**8/2/2018**	**8/6/2018**	**8/8/2018**	**8/9/2018**	**8/10/2018**	**8/13/2018**	**8/14/2018**	**8/15/2018**	**8/20/2018**	**8/21/2018**
Location		**North**	**South 2**	**South 1**	**North**	**North**	**South 2**	**South 1**	**South 2**	**North**	**North**	**South 2**
Dilution Factor (epilimnion water flow divided by nitrate flow)		299	316	303	292	279	303	296	302	315	310	319
Nitrate Flow_gauge	**gpm**	12.00	11.50	12.00	12.50	13.00	12.00	12.00	12.00	11.50	11.50	11.50
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	**gpm**	9.60	9.20	9.60	10.00	10.40	9.60	9.60	9.60	9.20	9.20	9.20
Epilimion Water Flow_System A	**gpm**	2930	2889	2920	2900	2940	2894	2806	2871	2903	2890	2974
Epilimion Water Flow_System B	**gpm**	2810	2933	2900	2940	2860	2923	2876	2920	2898	2817	2889
Water temperature_epilimnion	**degrees C**	24.99	24.76	26.5	26.02	25.68	25.7	26	25.37	24.9	25.1	24.37
Conductance_epilimnion (field)	**uS/cm**	1,801	1799	1820	1733	1753	1792	1792	1792	1726	1800	1791
Specific conductance_epilimnion (calc)	**uS/cm**	1801	1807	1769	1700	1731	1768	1758	1779	1729	1797	1813
Total Water Depth at Application Location	**feet**	60	64.25	64.5	59	59	64.25	64.25	64.1	62.5	62.7	64.5
Target Water Depth for Adding Nitrate	**feet**	56	57	56	52	51	56	56	56	56	56	56
Water Temperature _target depth	**degrees C**	9.5	8.96	8.93	9.44	9.56	9.87	9.05	9.34	10.65	13.01	9.1
Conductance _target depth (field)	**uS/cm**	1754	1748	1772	1753	1745	1870	1784	1227	1273	1397	1236
Specific Conductance _target depth (calc)	**uS/cm**	2492	2520	2557	2494	2475	2630	2566	1751	1754	1812	1775
Start time_dosing	**24-hour clock**	8:45	8:37	11:40	9:08	9:56	8:55	11:08	8:42	9:20	13:50	10:25
Start Volume_Tank A	**gallons**	2538	2538	2569	2538	1410	2569	2569	2569	2569	2569	2569
Start Volume_Tank B	**gallons**	2538	2538	2569	2538	1410	2569	2569	2569	2569	2569	2569
End Volume_Tank A	**gallons**	376	376	376	1410	376	376	376	376	376	376	752
End Volume_Tank B	**gallons**	376	376	376	1410	376	376	376	376	376	376	752
Total Volume of CN-8 Applied	**gallons**	4324	4324	4386	2256	2068	4386	4386	4386	4386	4386	3634
Total Mass of CN-8 Applied	**lbs as nitrogen**	4350	4351	4413	2270	2081	4413	4413	4413	4413	4413	3656
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 11.00 gpm, then adjusted to final	Started CN8 flowrate at 11.00 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 12.00 gpm, then adjusted to final	No chemical adjustments made	No chemical adjustments made	Started CN8 flowrate at 12.50 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 12.00 gpm, then adjusted to final	Started CN8 flowrate at 12.00 gpm, then adjusted to final	Started CN8 flowrate at 12.00 gpm, then adjusted to final
End Time_dosing	**24-hour clock**	12:40	12:35	15:27	11:10	11:32	12:55	14:54	12:34	13:15	17:51	14:00

Table 8.2
(Continued)
Summary of 2017 Applications of Nitrate in Onondaga Lake

Date		8/24/2018	8/27/2018	8/29/2018	8/30/2018	9/4/2018	9/6/2018	9/7/2018	9/10/2018	9/12/2018	9/13/2018	9/17/2018	9/19/2018	9/20/2018	9/24/2018
Location		South 1	South 1	North	South 2	South 1	North	South 2	South 1	North	South 2	South 1	North	South 2	South 1
Dilution Factor (epilimnion water flow divided by nitrate flow)		332	347	305	319	320	288	301	344	381	391	329	354	368	371
Nitrate Flow_gauge	gpm	10.50	10.00	12.00	11.50	10.50	12.50	12.00	9.50	9.50	9.00	10.50	10.00	9.50	9.00
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	8.40	8.00	9.60	9.20	8.40	10.00	9.60	7.60	7.60	7.20	8.40	8.00	7.60	7.20
Epilimion Water Flow_System A	gpm	2766	2727	2920	2924	2658	2924	2904	2604	2898	2777	2744	2890	2747	2576
Epilimion Water Flow_System B	gpm	2819	2819	2931	2939	2718	2831	2879	2628	2896	2850	2790	2776	2848	2772
Water temperature_epilimnion	degrees C	23.11	23.93	24.99	24.91	25.33	25.48	25.43	22.5	21.54	21.74	24.48	10.98	23.25	20.95
Conductance_epilimnion (field)	uS/cm	1795	1829	1843	1849	1898	1867	1871	1831	1761	1805	1890	1422	1835	1792
Specific conductance_epilimnion (calc)	uS/cm	1862	1867	1843	1852	1886	1850	1856	1923	1886	1925	1909	1942	1898	1942
Total Water Depth at Application Location	feet	64.2	64.6	62.6	65	66.7	59.9	65.8	67	59.5	64.3	66.5	64	67	63.7
Target Water Depth for Adding Nitrate	feet	58.5	58.5	56	56	59	51	56	59	54	56	59	55	55	59
Water Temperature _target depth	degrees C	10.81	9.8	9.93	10.2	10.09	9.64	9.46	9.9	9.95	9.47	9.8	9.66	9.66	9.86
Conductance _target depth (field)	uS/cm	1289	1241	1265	1259	1250	1244	1242	1256	1256	1240	1250	1247	1248	1259
Specific Conductance _target depth (calc)	uS/cm	1768	1749	1776	1755	1748	1760	1766	1765	1763	1763	1761	1764	1765	1771
Start time_dosing	24-hour clock	8:13	11:10	9:20	10:53	11:36	9:45	8:55	12:14	9:45	10:06	11:07	9:15	9:20	11:15
Start Volume_Tank A	gallons	2569	2569	2569	2569	2569	2569	2316	2254	2569	2569	2569	2535	2535	2569
Start Volume_Tank B	gallons	2569	2569	2569	2569	2569	2569	2569	2254	2569	2569	2569	2551	2535	2569
End Volume_Tank A	gallons	376	376	376	376	376	376	376	376	376	376	376	376	391	376
End Volume_Tank B	gallons	376	376	376	376	376	376	376	376	376	376	376	376	376	376
Total Volume of CN-8 Applied	gallons	4386	4386	4386	4386	4386	4386	4133	3756	4386	4386	4386	4334	4303	4386
Total Mass of CN-8 Applied	lbs as nitrogen	4413	4413	4413	4413	4413	4413	4159	3779	4413	4413	4413	4361	4330	4413
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 12.00 gpm, then adjusted to final	Started CN8 flowrate at 10.50 gpm, then adjusted to final	Started CN8 flowrate at 11.50 gpm, then adjusted to final	Started CN8 flowrate at 12.00 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 11.50 gpm, then adjusted to final	Started CN8 flowrate at 12.50 gpm, then adjusted to final	Started CN8 flowrate at 11.50 gpm, then adjusted to final	Started CN8 flowrate at 11.50 gpm, then adjusted to final	Started CN8 flowrate at 9.50 gpm, then adjusted to final	Started CN8 flowrate at 9.50 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 10.50 gpm, then adjusted to final	Started CN8 flowrate at 9.50 gpm, then adjusted to final
End Time_dosing	24-hour clock	12:20	15:45	13:11	14:51	15:55	13:30	12:40	15:54	14:22	15:24	15:20	13:50	14:10	16:15

Table 8.2
(Continued)
Summary of 2017 Applications of Nitrate in Onondaga Lake

Date		9/25/2018	9/27/2018	9/28/2018	10/1/2018	10/2/2018	10/3/2018	10/4/2018	10/8/2018	10/10/2018	10/11/2018	10/15/2018	10/16/2018
Location		North	North	South 2	South 1	South 2	North	South 1	South 1	North	South 2	South 1	North
Dilution Factor (epilimnion water flow divided by nitrate flow)		432	453	444	440	493	541	562	682	718	542	580	650
Nitrate Flow_gauge	gpm	8.50	8.00	8.00	7.50	7.00	6.50	6.00	5.00	5.00	6.50	6.00	5.50
Nitrate Flow_correction factor		0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Nitrate Flow_actual	gpm	6.80	6.40	6.40	6.00	5.60	5.20	4.80	4.00	4.00	5.20	4.80	4.40
Epilimion Water Flow_System A	gpm	2946	2901	2797	2577	2755	2745	2691	2724	2871	2829	2810	2808
Epilimion Water Flow_System B	gpm	2928	2902	2888	2706	2771	2882	2708	2733	2869	2806	2760	2908
Water temperature_epilimnion	degrees C	20.27	20.21	19.49	19.19	18.8	18.27	18.53	18.23	19.29	19.05	16.89	15.89
Conductance_epilimnion (field)	uS/cm	1738	1738	1730	1717	1705	1668	1690	1669	1693	1688	1611	1575
Specific conductance_epilimnion (calc)	uS/cm	1911	1913	1933	1931	1934	1914	1928	1917	1900	1904	1906	1907
Total Water Depth at Application Location	feet	59.7	62.3	65.1	64.7	65.1	62.2	65.7	64	61.4	64.7	64.3	59.8
Target Water Depth for Adding Nitrate	feet	56	56	56	59	56	56	59	59	56	56	59	56
Water Temperature _target depth	degrees C	10.3	9.98	9.75	15.41	10.12	10.18	9.72	10.64	10.63	10.87	11.31	10.63
Conductance _target depth (field)	uS/cm	1268	1272	1253	1627	1265	1270	1263	1300	1292	1311	1330	1300
Specific Conductance _target depth (calc)	uS/cm	1763	1784	1768	1992	1767	1771	1784	1791	1781	1796	1801	1792
Start time_dosing	24-hour clock	9:50	9:15	9:06	12:02	10:30	10:05	10:00	11:30	8:20	9:30	11:15	9:55
Start Volume_Tank A	gallons	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569	2412
Start Volume_Tank B	gallons	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569	2569	2412
End Volume_Tank A	gallons	376	376	376	689	626	595	809	1189	493	376	752	721
End Volume_Tank B	gallons	376	376	376	689	626	657	809	1189	493	376	752	658
Total Volume of CN-8 Applied	gallons	4386	4386	4386	3760	3886	3886	3521	2759	4151	4386	3634	3446
Total Mass of CN-8 Applied	lbs as nitrogen	4413	4413	4413	3783	3910	3910	3543	2776	4177	4413	3657	3467
Comments (nitrate flows are based on gauge readings)		Started CN8 flowrate at 9.00 gpm, then adjusted to final	Started CN8 flowrate at 8.50 gpm, then adjusted to final	Started CN8 flowrate at 8.50 gpm, then adjusted to final	Started CN8 flowrate at 8.00 gpm, then adjusted to final	Started CN8 flowrate at 7.50 gpm, then adjusted to final	Started CN8 flowrate at 7.00 gpm, then adjusted to final	Started CN8 flowrate at 6.50 gpm, then adjusted to final	Started CN8 flowrate at 6.00 gpm, then adjusted to final	No chemical adjustments made	Started CN8 flowrate at 5.00 gpm, then adjusted to final	Started CN8 flowrate at 6.50 gpm, then adjusted to final	Started CN8 flowrate at 6.00 gpm, then adjusted to final
End Time_dosing	24-hour clock	15:20	15:10	15:00	17:25	16:35	16:30	16:15	17:15	17:10	17:15	18:00	16:45

Table 8.3
Onondaga Lake Monitoring Scope for 2018 Nitrate Addition

Date (Week of:)	South Deep Water column Samples	Analysis Suite	Field Nitrate Profiling 34 Locations	Zooplankton	Sediment Trap Mercury (10m water depth)	Dissolved Gas Measurements
2-April	-	-	10	-	-	-
9-April	-	-	2	-	-	-
23-April	-	-	10	-	-	-
30-April	-	-	10	-	-	-
7-May	-	-	10	-	-	-
14-May	3	1, 2	10	□	○	-
21-May	-	-	10	-	○	-
28-May	-	-	3	□	○	-
6-June	-	-	10	-	○	-
11-June	3	1, 2	34, 10	□	○	⊙
18-June	3	1, 2	34, 10	-	○	-
25-June	3	1,2	34, 10	-	○	-
2-July	4	3, 4	34, 11	□	○	-
9-July	4	1, 2	34, 11	-	○	⊙
16-July	5	3, 4	34, 11	□	○	-
23-July	4	1, 2	34, 11	-	○	-
30-July	4	3	34, 11	□	○	-
6-Aug	4	1, 2	34, 11	-	○	-
13-Aug	5	3	34, 11	□	○	-
20-Aug	4	1, 2	34, 11	-	○	-
27-Aug	-	-	34, 11	-	-	-
3-Sept	4	1, 2	34, 11	□	○	-
10-Sept	5	3	34, 11	□	○	-
17-Sept	4	1, 2	34, 11	□	○	-
24-Sept	5	3	34,11	□	○	-
1-Oct	4	1, 2	34, 11	□	○	-
8-Oct	5	3	34, 11	□	○	-
15-Oct	4	1, 2	34	□	○	-
22-Oct	5	3	11	□	○	-
29-Oct	-	-	11	-	-	-
5-Nov	-	-	11	-	-	-
19-Nov	3	1, 2	-	□	○	-

1: LLHg, meHg; 2: NO_X, NO_2, t-NH_3; 3: LLHg, meHg, NO_X, NO_2, t-NH_3, SRP, Fe^{2+}; 4: Mn; Fe^{2+} and Mn were discontinued after 7/17/18.

Additional Notes:

1. Sediment traps were deployed typically for seven days.
2. Sediment trap results for 2018 are reported in the 2018 MNR Data Summary Report.
3. Fall turnover occurred on 25 October, 2018 after which only three water depths were collected per sampling date.
4. From June 11 through October 17 field nitrate profiling was conducted weekly at 34 locations and 10 of the locations were monitored again later in the week. During the week of July 2, additional monitoring increased to 11 locations. In addition, approximately seven profiles were taken near the barge while nitrate was applied

Table 8.4
Key Nitrate Addition Inter-Annual Variations in Onondaga Lake

Year	Spring Turnover Nitrate-N, mg/L	Metric Tons of Calcium-Nitrate Applied	Duration of Summer Stratification, days*
2011	2.0	88	184
2012	2.6	72	163
2013	2.9	63	178
2014	2.3	57	167
2015	2.5	56	180
2016	2.5	67	191
2017	2.2	88	203
2018	1.6	105	172

* The duration of stratification is calculated from South Deep buoy profiles as the number of consecutive days with a temperature difference of at least 1°C between the surface and bottom waters.

Table 8.5
2018 Mercury Concentrations (ng/L) in Surface Water Near the Lake Bottom at the 18-Meter Water Depth at South Deep, Onondaga Lake

2018 Sampling Collection Date	Total Mercury	Validation Qualifier	Methyl Mercury	Validation Qualifier
16-May	0.55		0.033	J
12-Jun	0.78		0.040	J
26-Jun	0.88		0.039	J
2-Jul	0.90		0.026	U
10-Jul	0.89		0.028	J
17-Jul	0.92		0.110	
24-Jul	0.60		0.071	
31-Jul	0.82		0.118	
7-Aug	1.07		0.130	
16-Aug	1.08	J	0.132	
21-Aug	0.61		0.141	
28-Aug	0.89		0.318	
5-Sep	0.66		0.163	
11-Sep	0.69		0.072	
18-Sep	0.80		0.057	
27-Sep	1.01		0.072	
2-Oct	1.33		0.049	J
9-Oct	2.79		0.064	
16-Oct	2.59		0.070	
24-Oct	2.09		0.028	J
7-Nov	3.58		0.026	U
19-Nov	1.08		0.026	U

U – not detected at reporting limit specified
J – estimated concentration

Table 8.6
2018 Dissolved Mercury Concentrations (ng/L) in Surface Water at the 2-Meter Water Depth at South Deep, Onondaga Lake

2018 Sampling Collection Date	Total Dissolved Mercury	Validation Qualifier
16-May	0.23	J
12-Jun	0.24	J
26-Jun	0.17	J
10-Jul	0.19	J
24-Jul	0.13	J
7-Aug	0.17	J
21-Aug	0.14	J
5-Sep	0.08	U
18-Sep	0.13	J
2-Oct	0.1	J
16-Oct	0.08	J
7-Nov	0.24	J
19-Nov	0.27	J

U – not detected at reporting limit specified
J – estimated concentration

Supplemental Table
Field Nitrate and Mercury Results at Supplemental Collection Sites in 2018 with Comparison to 12m Results at South Deep.

Date	Depth (m)	Site	Field NO_3^- (mg/L)	Suppl. Site Total Hg (ng/L)	South Deep Total Hg (ng/L) at 12m	Site	Suppl. Site Methyl Hg (ng/L)	South Deep Methyl Hg (ng/L) at 12m
20-Sep	10	ISUS-27	0.78	**0.60**	0.55 (sampled 18-Sept)	ISUS-27	0.08	0.103 (sampled 18-Sept)
	10	ISUS-28	0.74	0.41		ISUS-28	**0.135**	
	10	ISUS-31	0.80	0.40		ISUS-31	**0.12**	

*bold-red indicated that supplemental site results were higher than South Deep results

FIGURES

FIGURE 2.1

Honeywell ONONDAGA LAKE SYRACUSE, NEW YORK

MOUTH OF NINEMILE CREEK VEGETATION COVER TYPES 2018

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\VEG COVER\450704_VEG_2018-001.DWG
PLOT DATE: 6/14/2019 1:33 PM PLOTTED BY: RUSSO, JILL

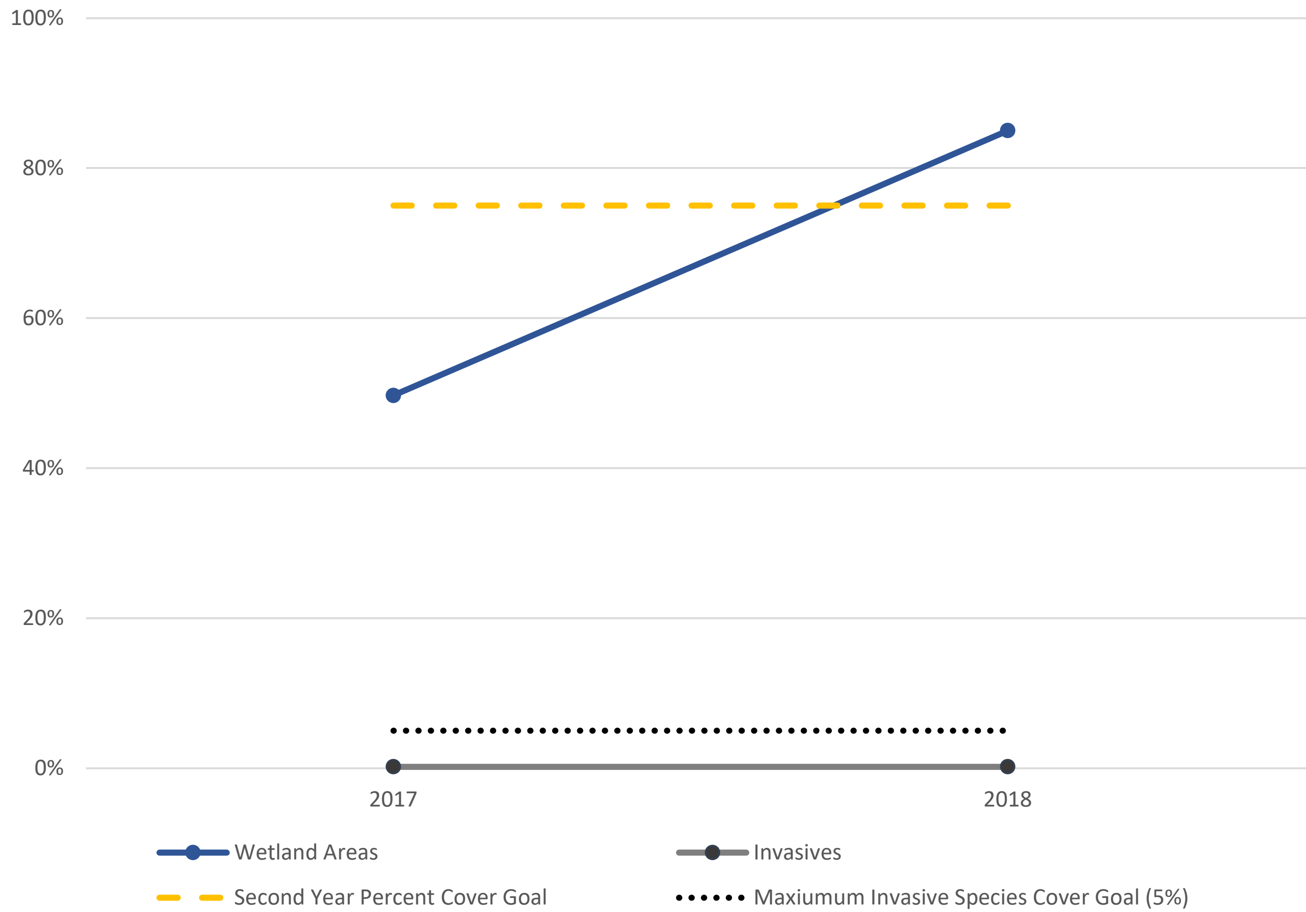


FIGURE 2.2

Honeywell

Onondaga Lake
Syracuse, New York

Mouth of Ninemile Creek Vegetation Trends

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560

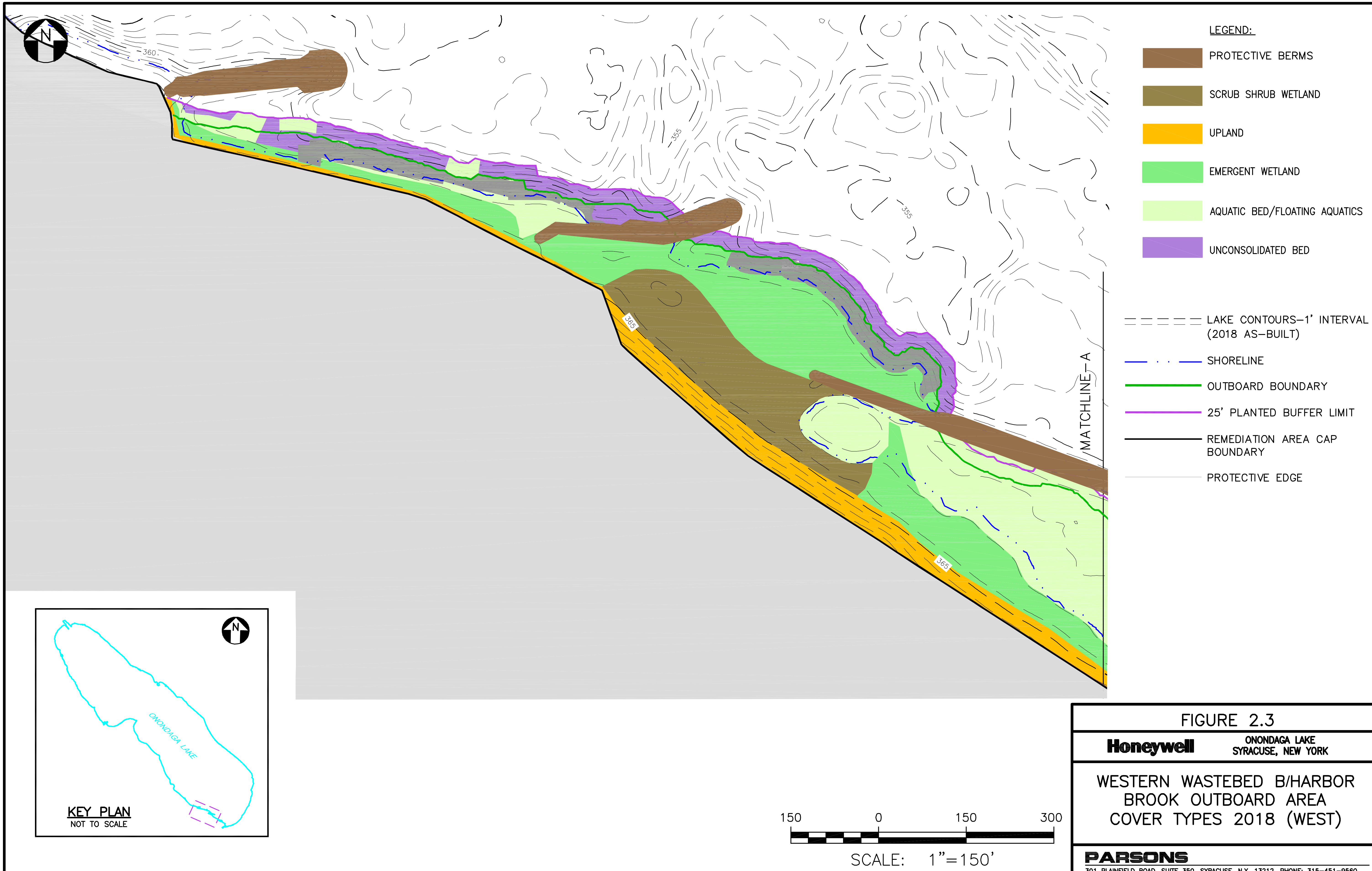


FIGURE 2.3

Honeywell

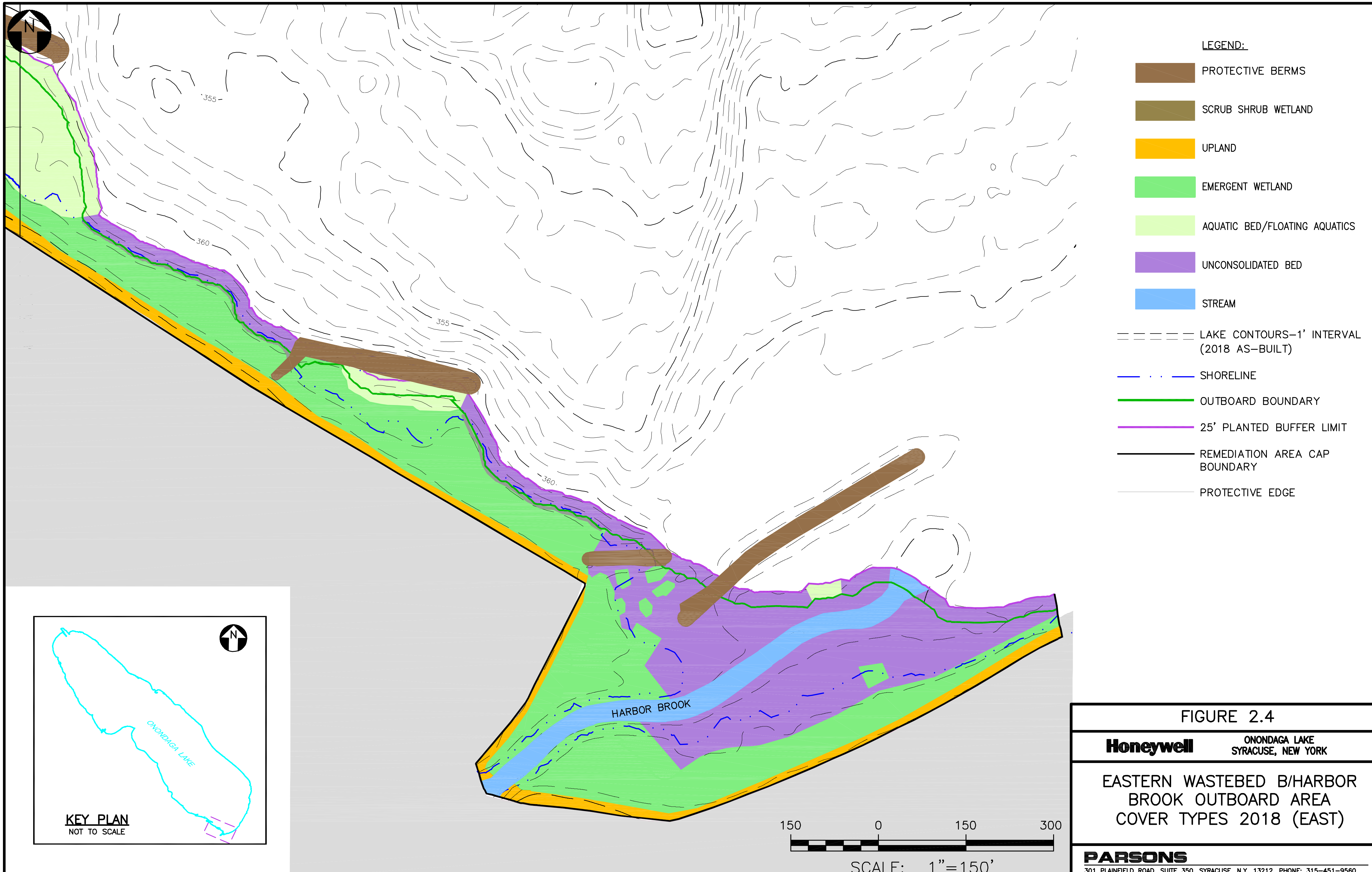
ONONDAGA LAKE
SYRACUSE, NEW YORK

WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA COVER TYPES 2018 (WEST)

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\VEG COVER\450704_VEG_2018-002.DWG
PLOT DATE: 6/14/2019 2:00 PM PLOTTED BY: RUSSO, JILL



FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\VEG COVER\450704_VEG_2018-002.DWG
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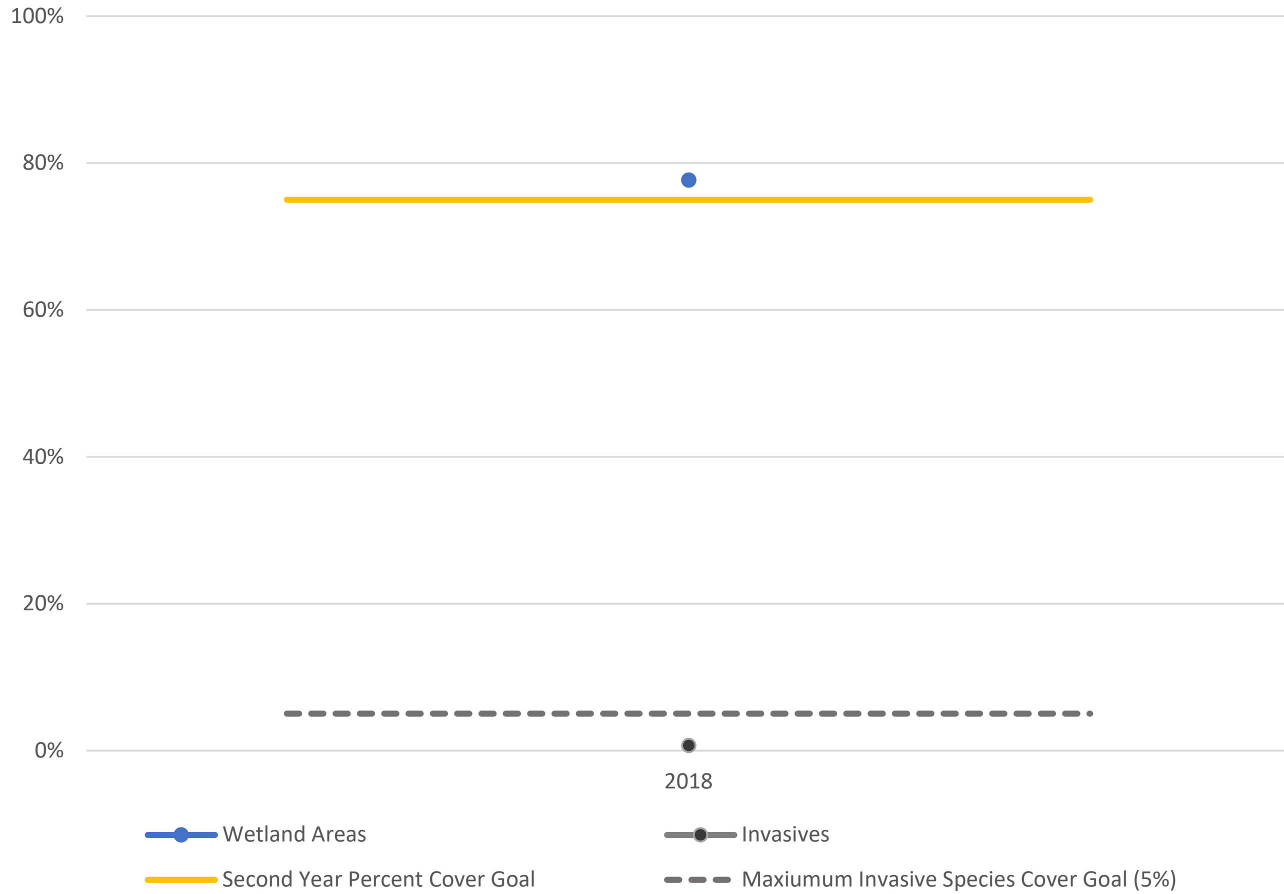


Note: First year target is for expansion from initial plantings. Second year goal is shown for context

FIGURE 2.5

Honeywell

Onondaga Lake
Syracuse, New York

Wastebed B/Harbor Brook Vegetation Trends

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560

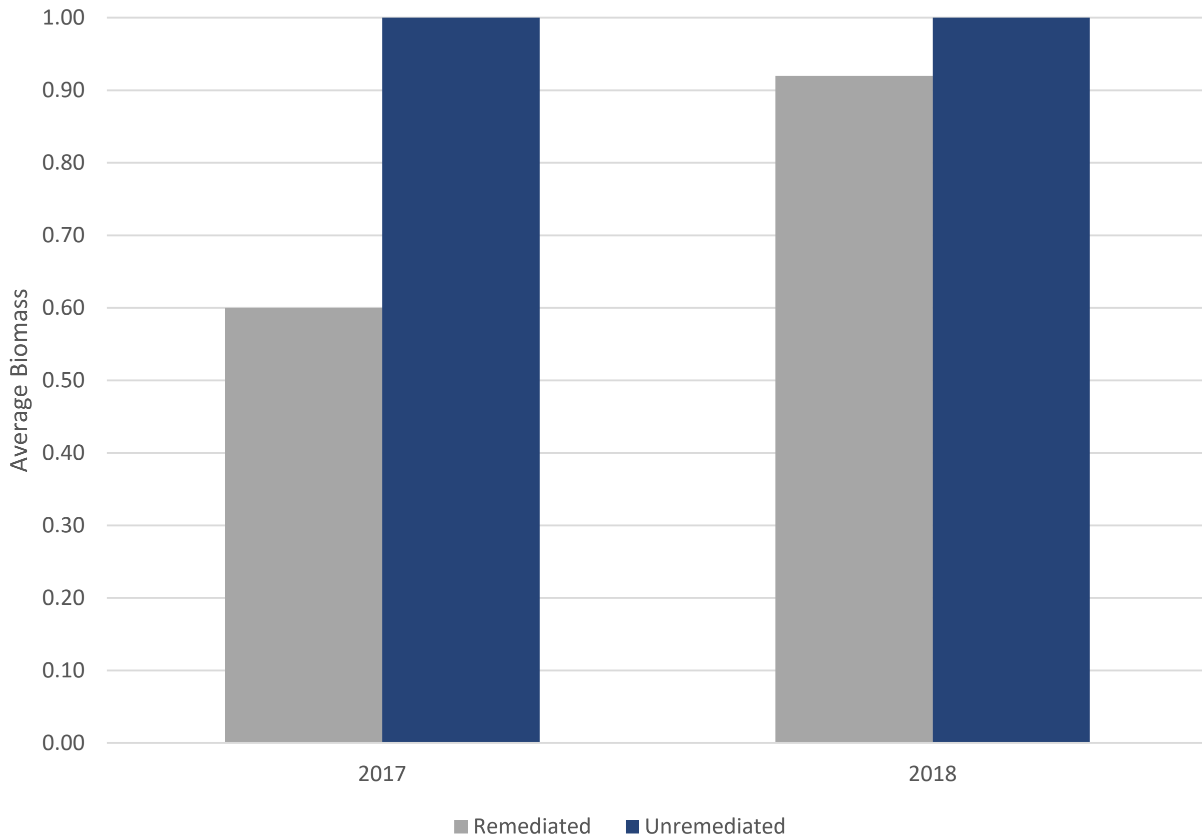


FIGURE 2.6

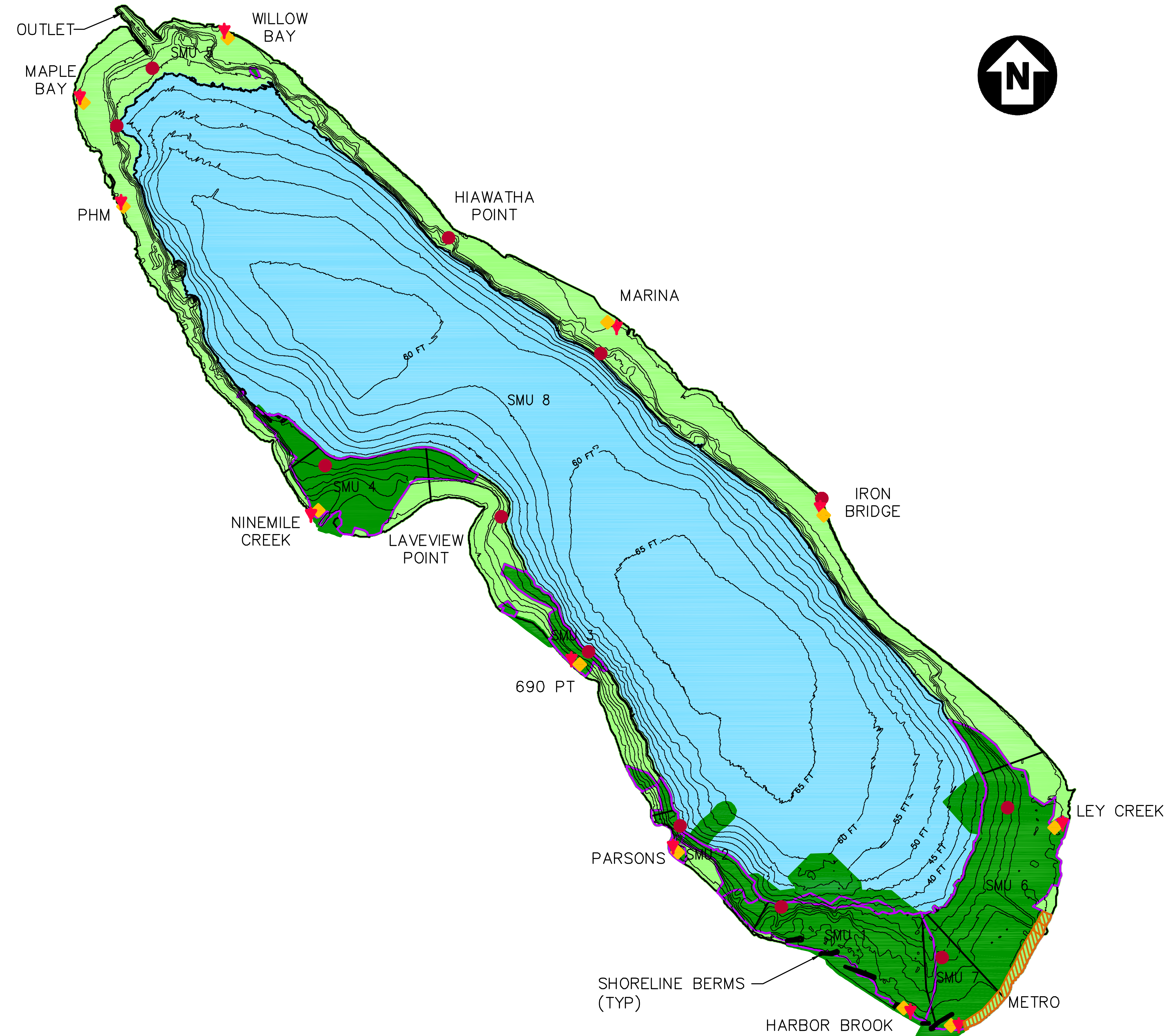
Honeywell

Onondaga Lake
Syracuse, New York

Onondaga Lake Macrophyte Cover Trends

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560



TRAP NET

GILL NET

SEINE

REMEDIATION AREA BOUNDARY

SMU BOUNDARY

PROFUNDAL ZONE (SMU 8)

LITTORAL ZONE

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

CSX SHORELINE

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST–REMEDY CONTOURS SHOWN)
2. SEINE SITES CO–LOCATED WITH SMALL PREY FISH TISSUE COLLECTION LOCATIONS (DETAILED IN SECTION 3 OF THIS REPORT).
3. EXACT LOCATIONS WERE ADJUSTED SLIGHTLY IN THE FIELD BASED ON WATER DEPTH AND WITH THE INTENT OF BEING PROTECTIVE OF NEWLY INSTALLED VEGETATION (WHERE APPLICABLE). DUE TO PLANTING ACTIVITIES IN THE OUTBOARD/HARBOR BROOK, THE HARBOR BROOK LOCATION WAS ONLY SAMPLED IN AUGUST, SEPTEMBER, AND OCTOBER OF 2018.

2000 1000 0 2000 4000

SCALE: 1"=2000'

FIGURE 2.7

Honeywell — ONONDAGA LAKE SYRACUSE, NEW YORK

2018 FISH COMMUNITY SAMPLING LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL –SYR\450102 – 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2018\450102–MNR–2018–06.DWG
PLOT DATE: 6/13/2019 2:06 PM PLOTTED BY: RUSSO, JILL

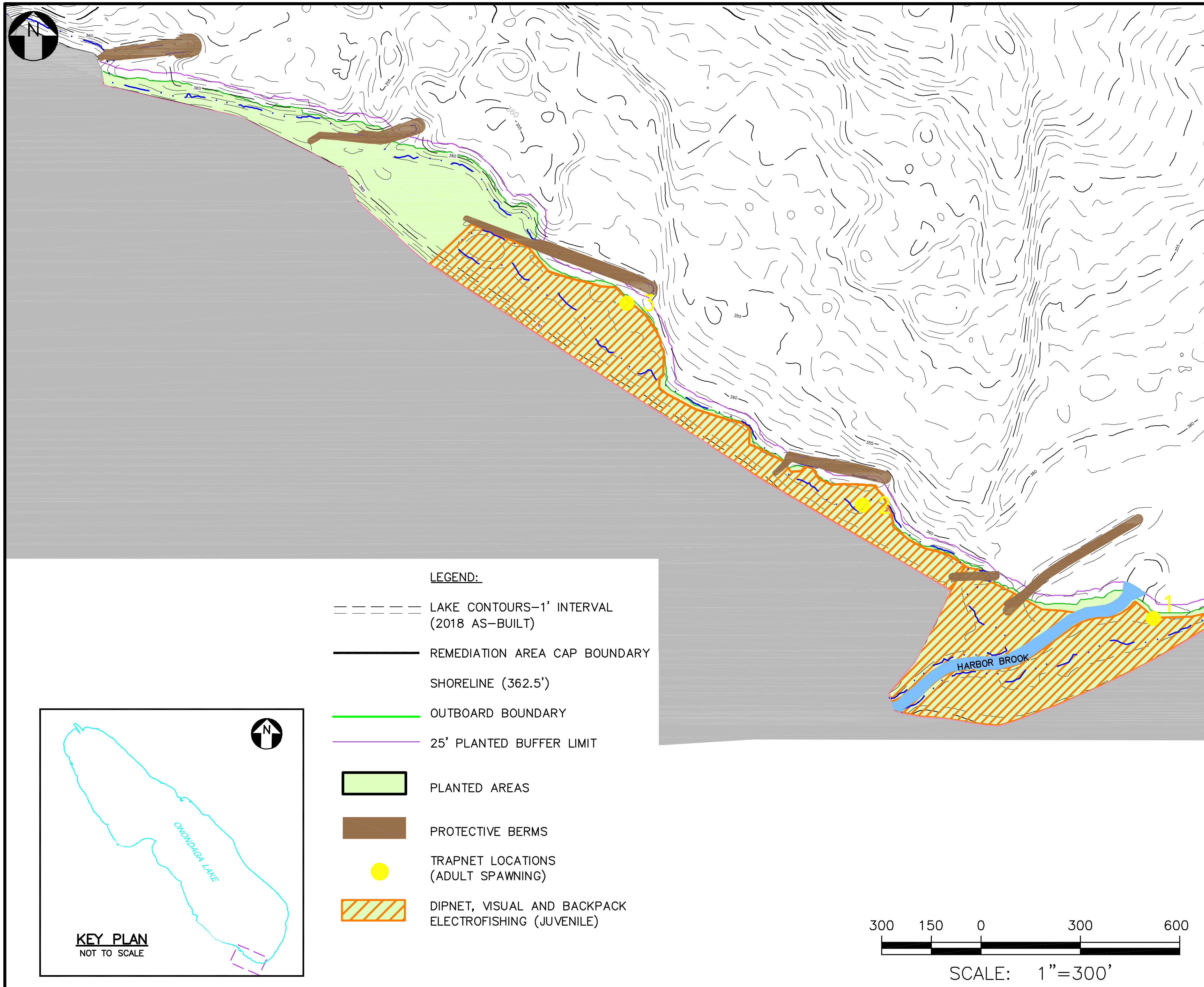


FIGURE 2.8

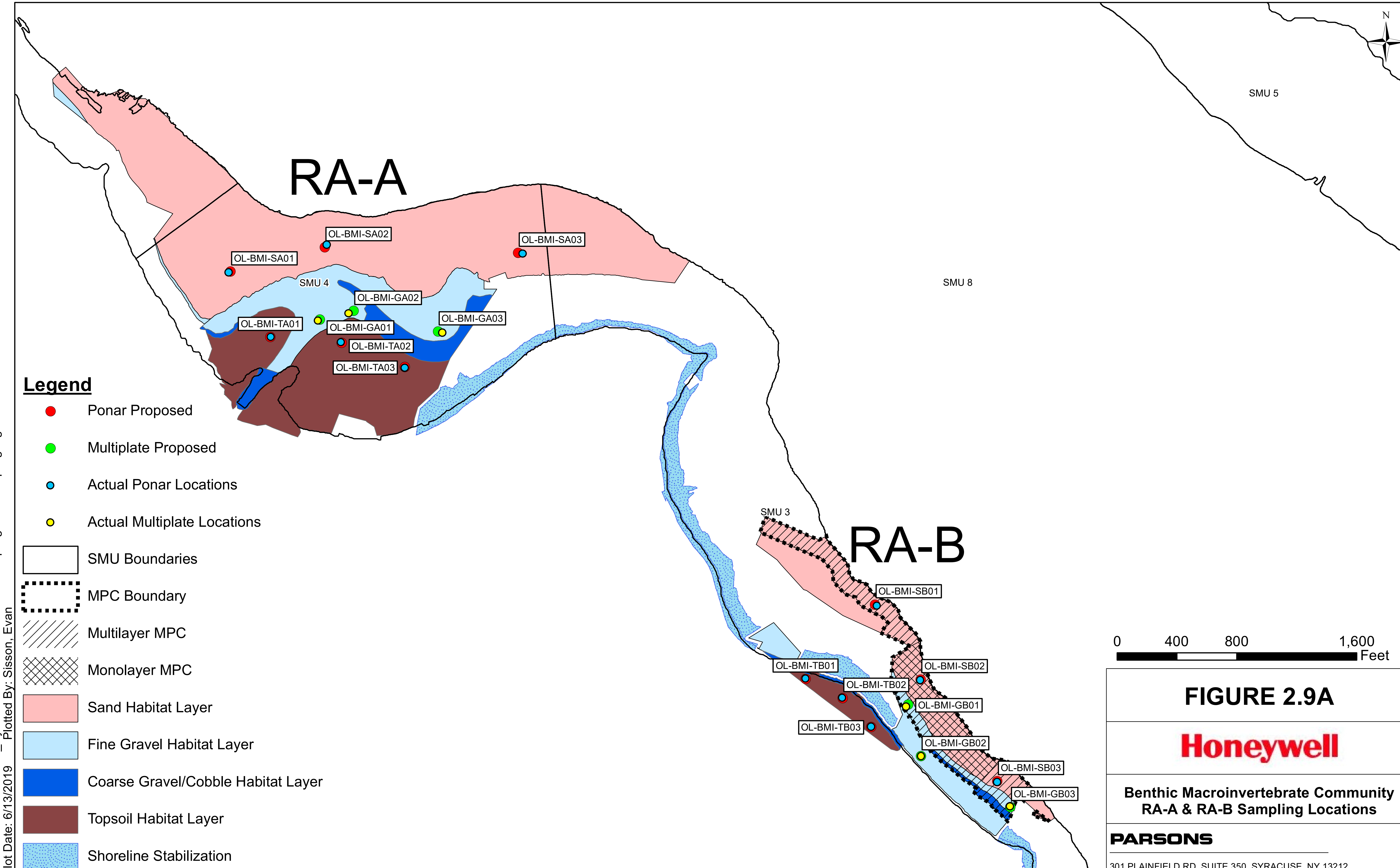
Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

2018 WETLAND SPAWNING ADULT AND JUVENILE MONITORING LOCATIONS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2018 ANNUAL REPORT\450704-ANNUALRPT-SPAWN-2018-06.DWG
PLOT DATE: 6/14/2019 2:20 PM PLOTTED BY: RUSSO, JILL



File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\BMI Sampling\BMI Sampling Figure 2.9A.mxd
Plot Date: 6/13/2019 Plotted By: Sisson, Evan

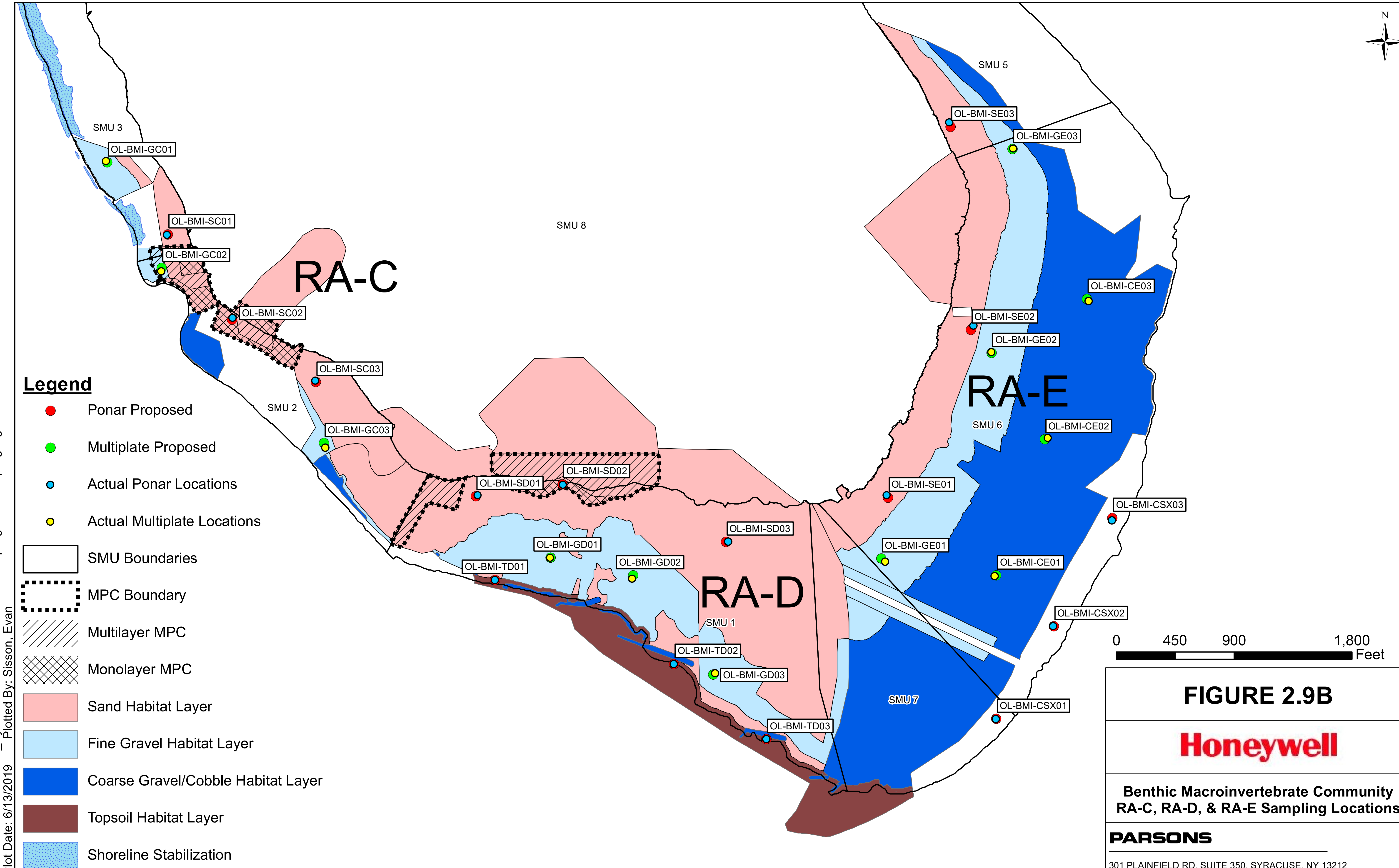
FIGURE 2.9A

Honeywell

Benthic Macroinvertebrate Community RA-A & RA-B Sampling Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212



File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\BMI Sampling\BMI Sampling Figure 2.9B.mxd
Plot Date: 6/13/2019 Plotted By: Sisson, Evan

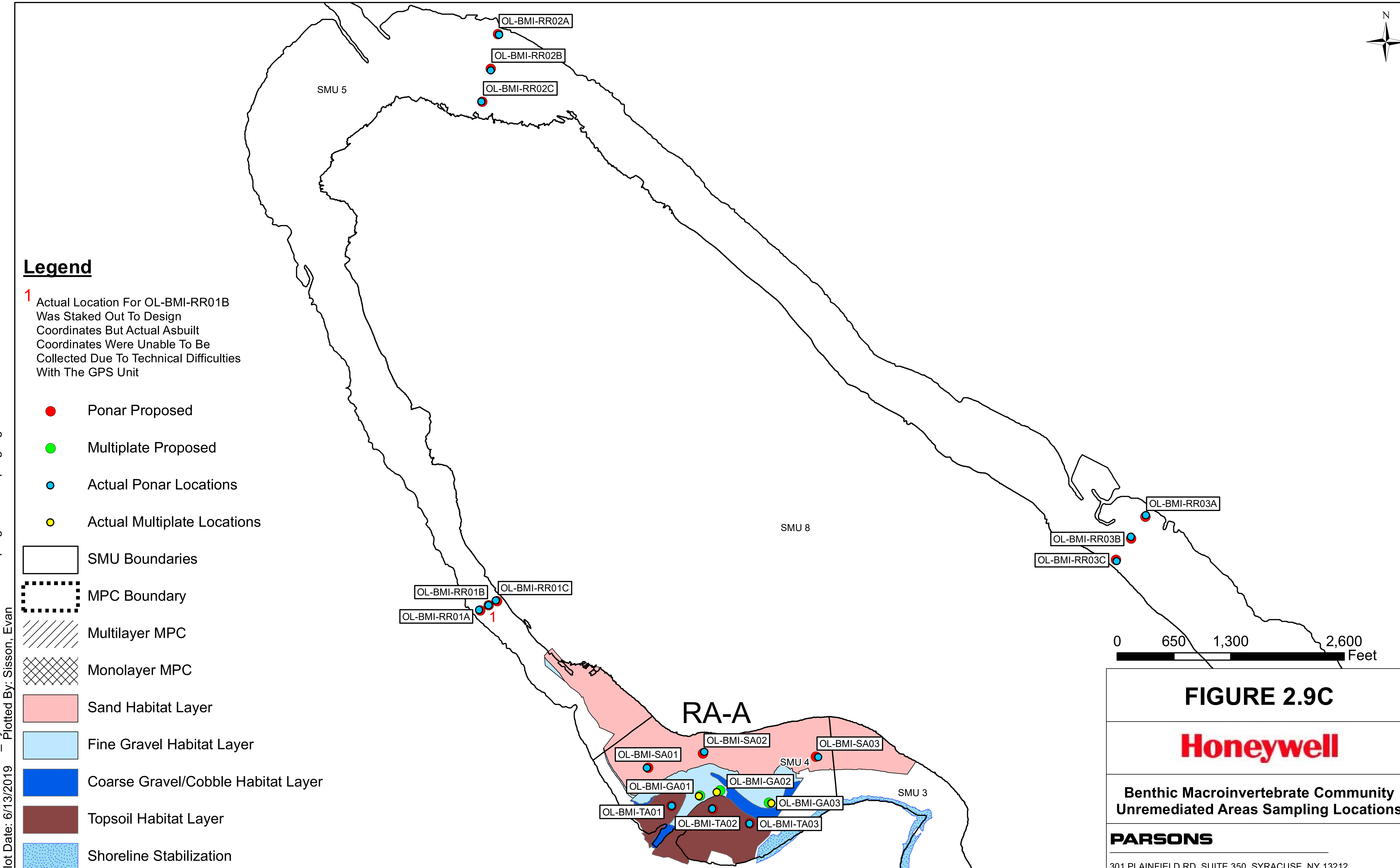


FIGURE 2.9C

Honeywell

Benthic Macroinvertebrate Community Unremediated Areas Sampling Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: Q:\GIS\Hon_Syracuse\OLMMS\MXDs\BMI Sampling\BMI Sampling Figure 2.9C.mxd
Plot Date: 6/13/2019 Plotted By: Sisson, Evan

FIGURE 2.10

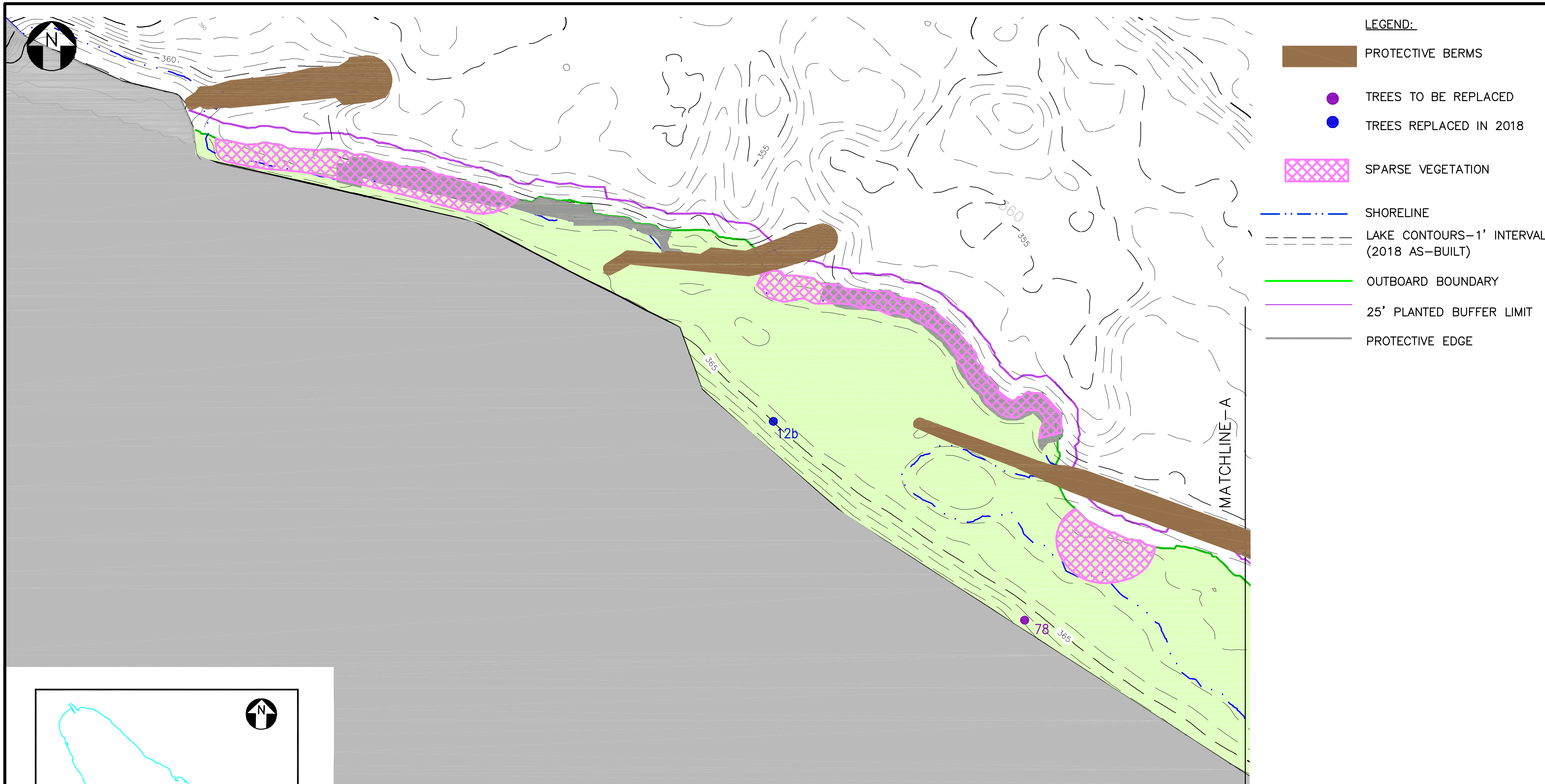
Honeywell

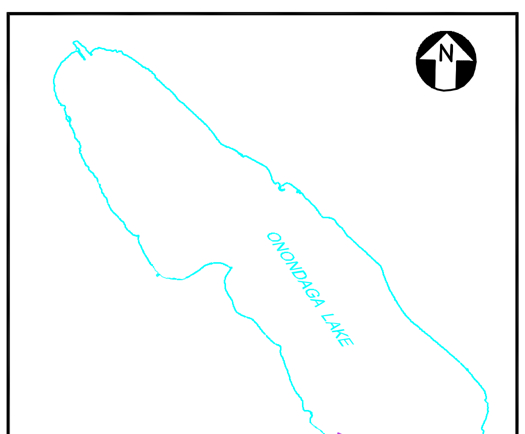
ONONDAGA LAKE
SYRACUSE, NEW YORK

MOUTH OF NINEMILE CREEK
FOCUS AREAS FOR 2019

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\FOCUS-2019\450704_FOCUS_19_001.DWG
PLOT DATE: 6/14/2019 1:37 PM PLOTTED BY: RUSSO, JILL





KEY PLAN
NOT TO SCALE

150 0 150 300

SCALE: 1"=150'

FIGURE 2.11

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

WESTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA FOCUS AREAS FOR 2019

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017–2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\FOCUS–2019\450704_FOCUS_19_002.DWG
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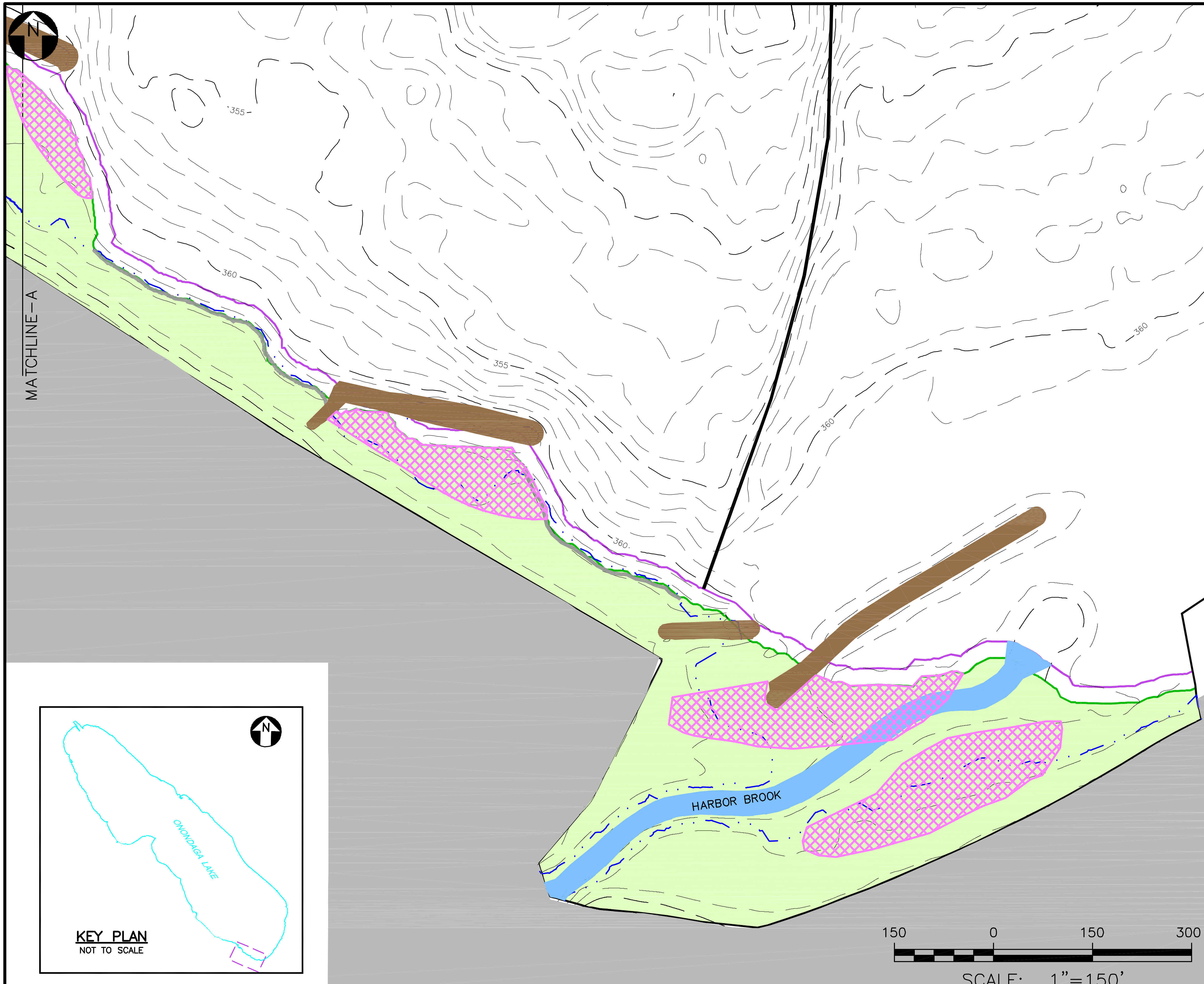

FIGURE 2.12

Honeywell ONONDAGA LAKE SYRACUSE, NEW YORK

EASTERN WASTEBED B/HARBOR BROOK OUTBOARD AREA FOCUS AREAS FOR 2019

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\FOCUS-2019\450704_FOCUS_19_002.DWG
PLOT DATE: 6/14/2019 2:28 PM PLOTTED BY: RUSSO, JILL

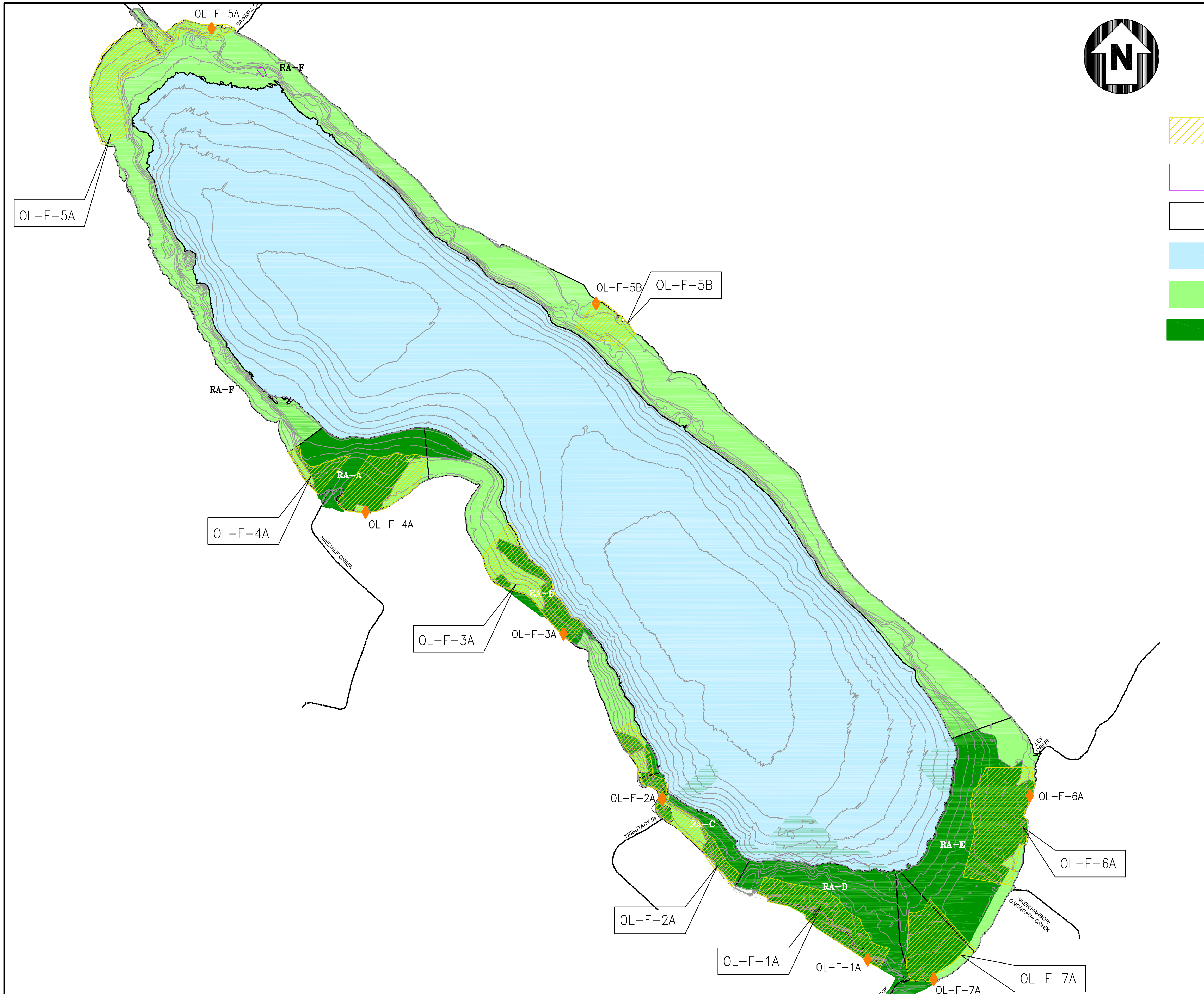

FIGURE 3.1

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

2018 SAMPLING LOCATIONS FOR FISH TISSUE CHEMICAL ANALYSIS

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2018 ANNUAL REPORT\450704-ANNUALRPT-2018-01.DWG
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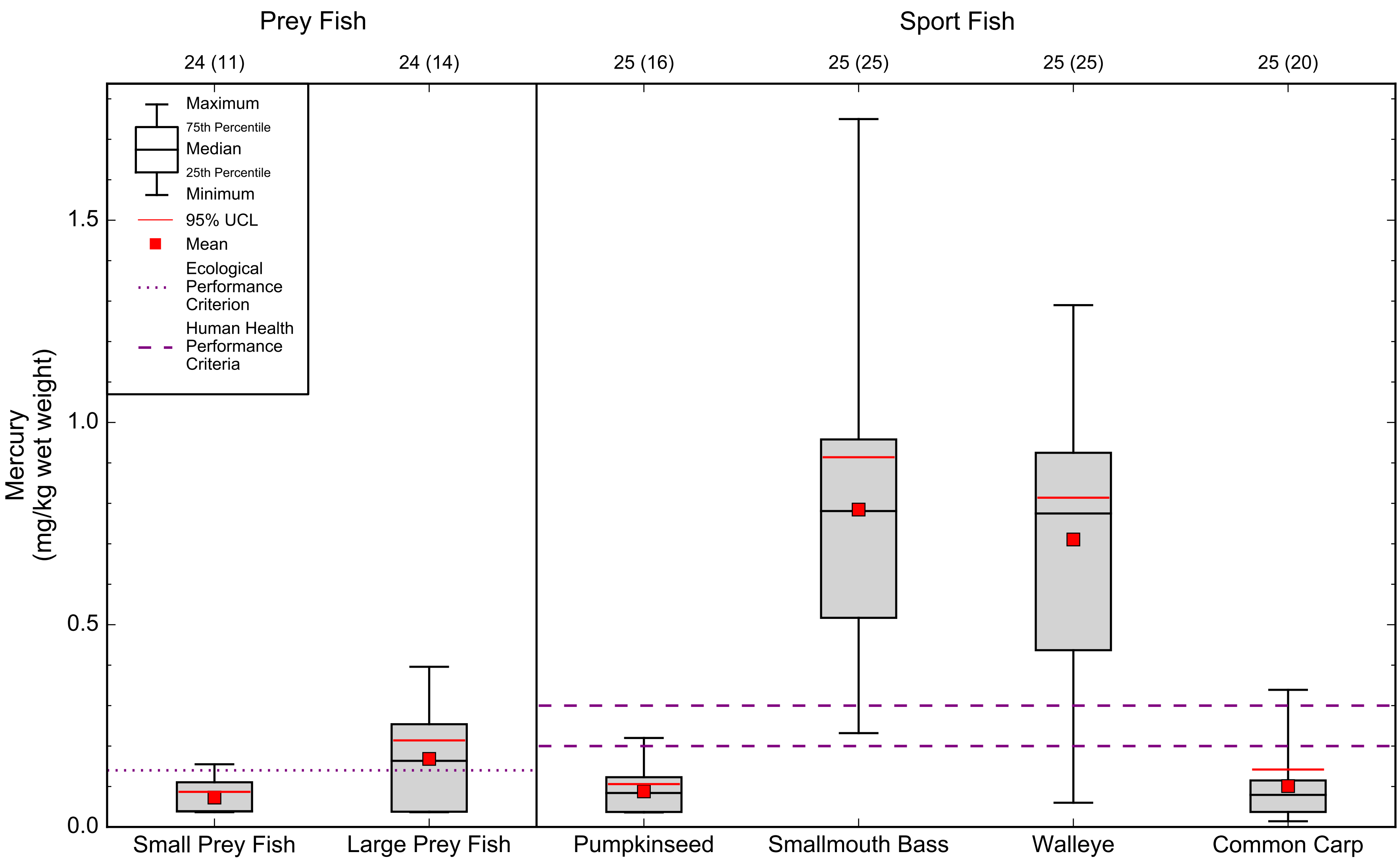


Figure 3.2

Box and Whisker Plots of Mercury Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Non-detects included at 1/2 MDL.

Small Prey Fish are whole-body composites, Large Prey Fish are individual whole-body samples, Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Preliminary draft.

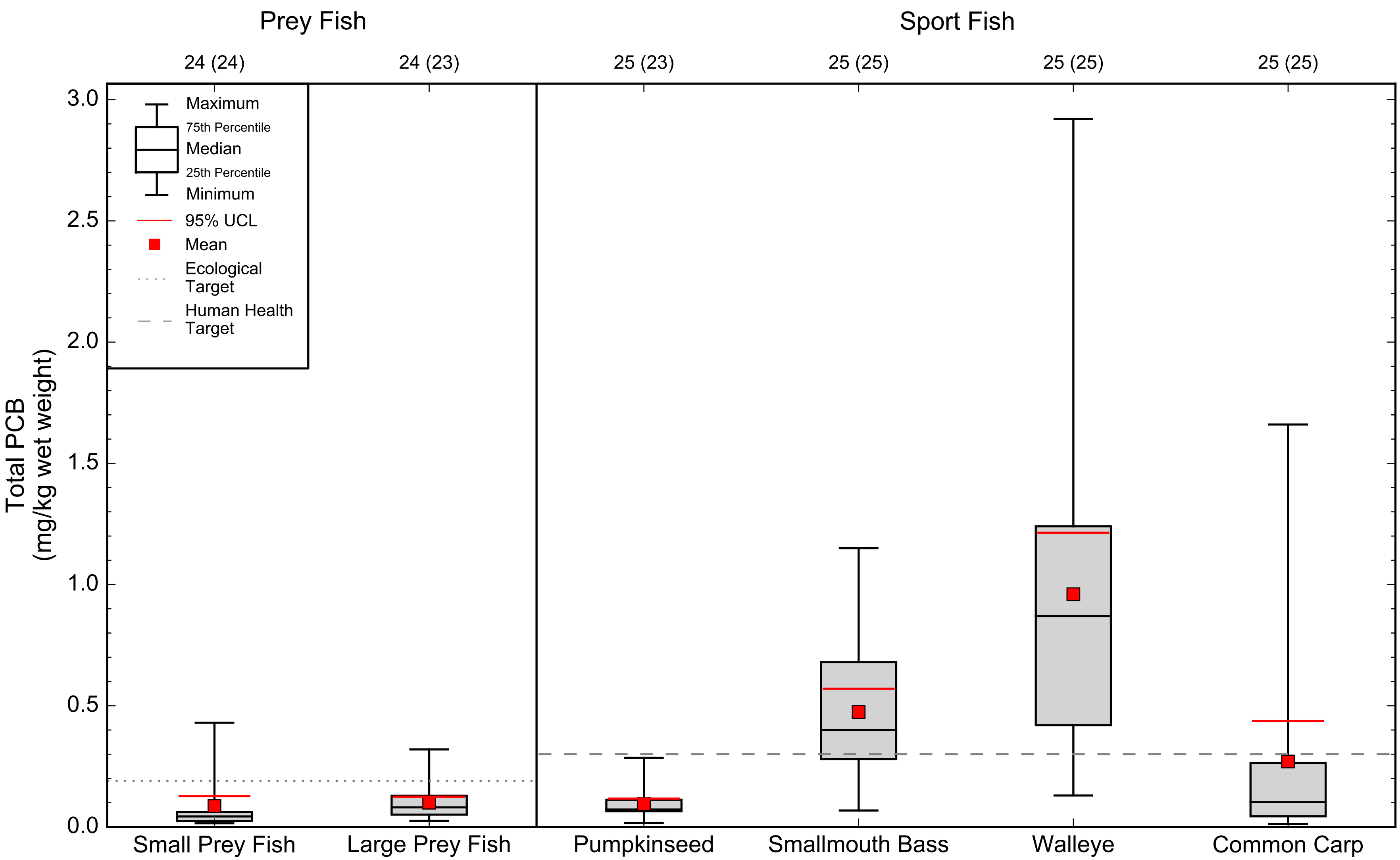


Figure 3.3

Box and Whisker Plots of Total PCB Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses.
Non-detects included at 1/2 RL. TPCB is the sum of detected Aroclors.
Targets are not performance criteria.
Small Prey Fish are whole-body composites, Large Prey Fish are individual whole-body samples, Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Preliminary draft.

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_boxplots.py 5/21/2019 11:28:55

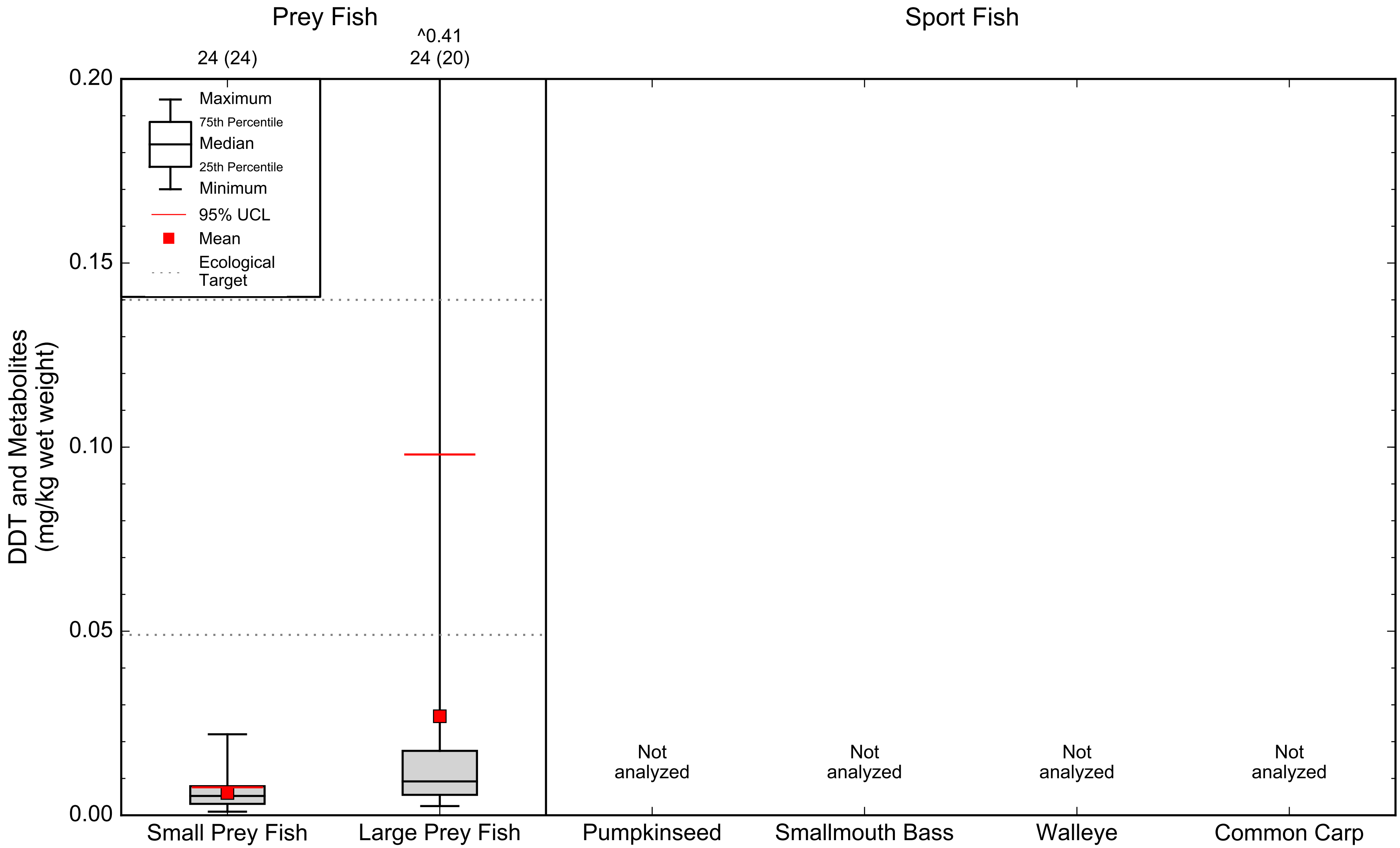


Figure 3.4

Box and Whisker Plots of DDT and Metabolites Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses."^" indicates result value above axis range.
Non-detects included at 1/2 RL.
Small Prey Fish are whole-body composites,
Large Prey Fish are individual whole-body samples. Sport fish were not analyzed for DDT and Metabolites.
Targets are not performance criteria Preliminary draft.

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_boxplots.py 5/21/2019 11:28:56

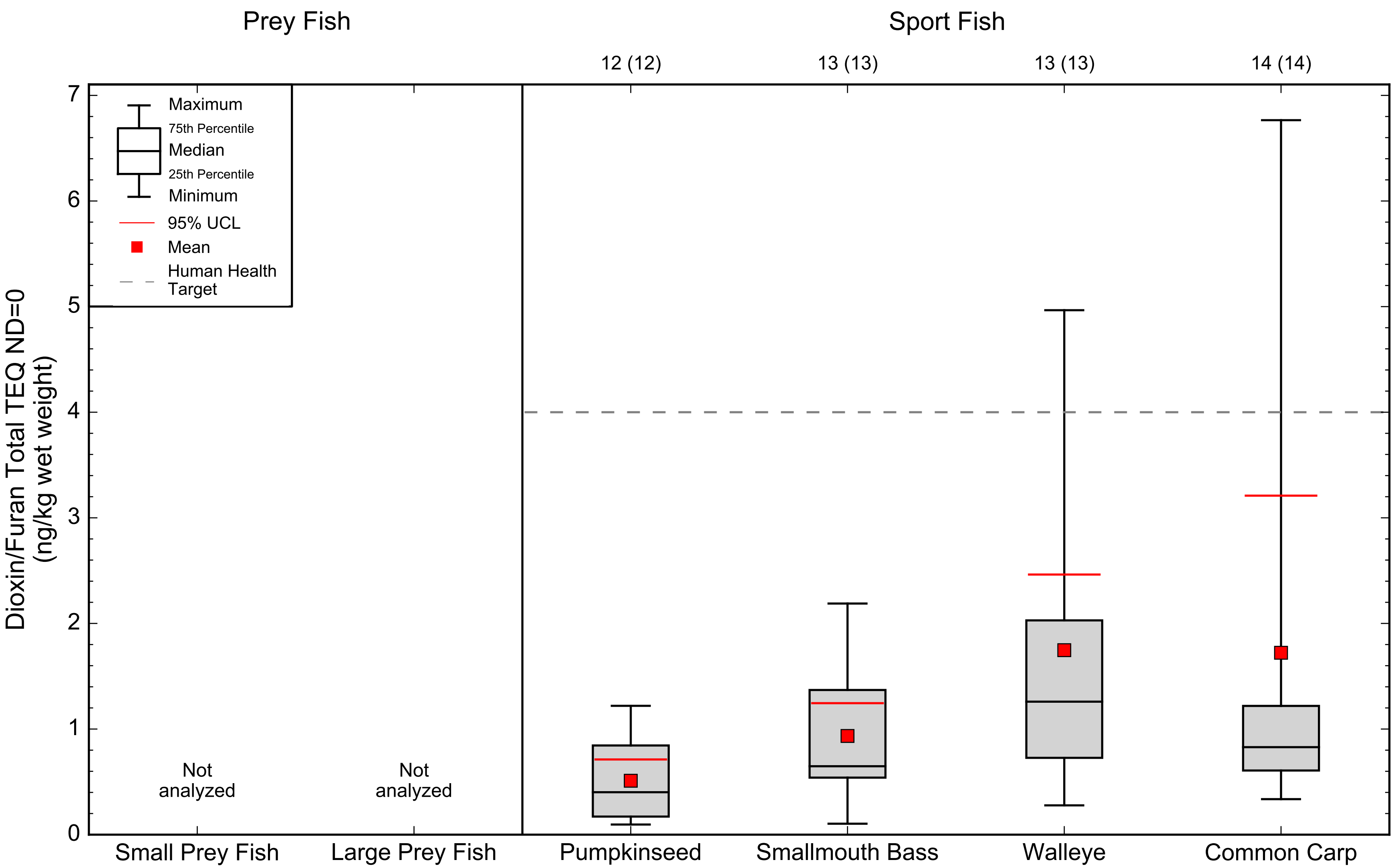


Figure 3.5

Box and Whisker Plots of Dioxin/Furan Total TEQ (ND=0) Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Individual non-detects excluded from the Total TEQ calculation. If all individual congeners were not detected, the Total TEQ result is reported at 0. Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Small and large prey fish were not analyzed for dioxin/furans. Targets are not performance criteria. Preliminary draft.

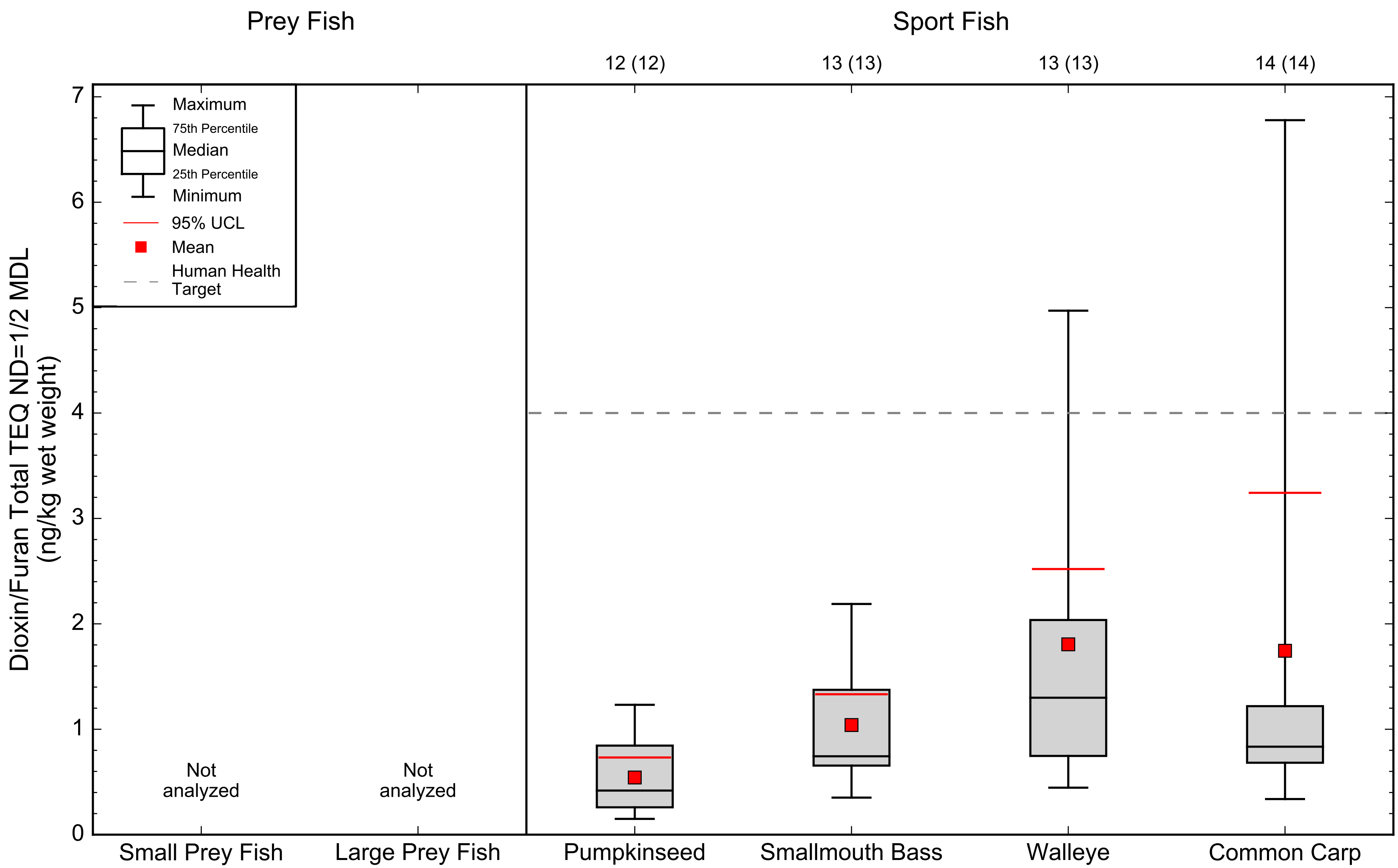


Figure 3.6

Box and Whisker Plots of Dioxin/Furan Total TEQ (ND=1/2 MDL) Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Individual non-detects included in the Total TEQ calculation at 1/2 MDL. Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Small and large prey fish were not analyzed for dioxin/furans. Targets are not performance criteria. Preliminary draft.

ANCHOR QEA

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_boxplots.py 5/21/2019 11:28:56

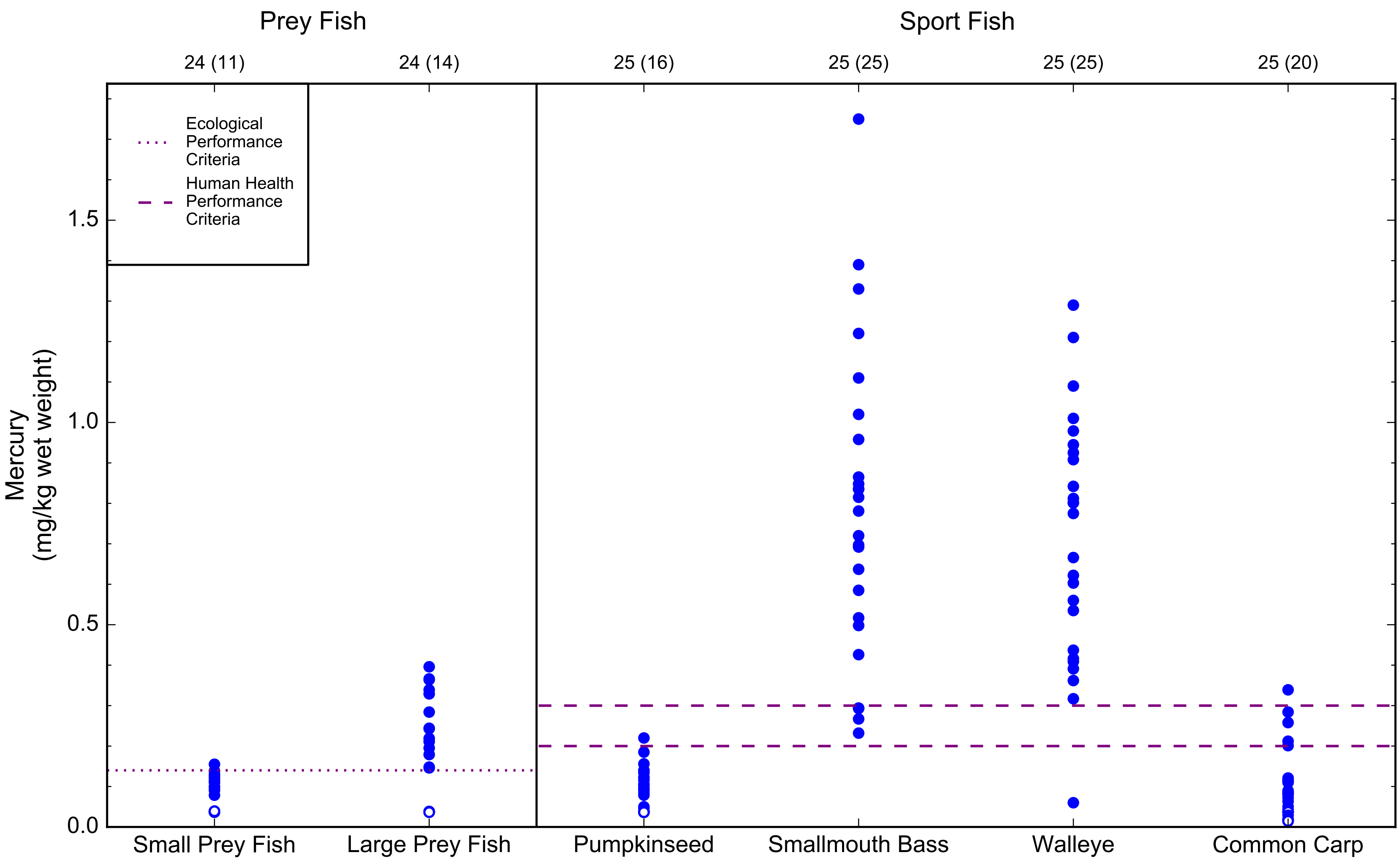


Figure 3.7

Scatter Plot of Mercury Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Non-detects included at 1/2 MDL. Open symbols indicate results were non-detect. Small Prey Fish are whole-body composites, Large Prey Fish are individual whole-body samples, Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Preliminary draft.

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_scatterplots.py 5/21/2019 11:27:26

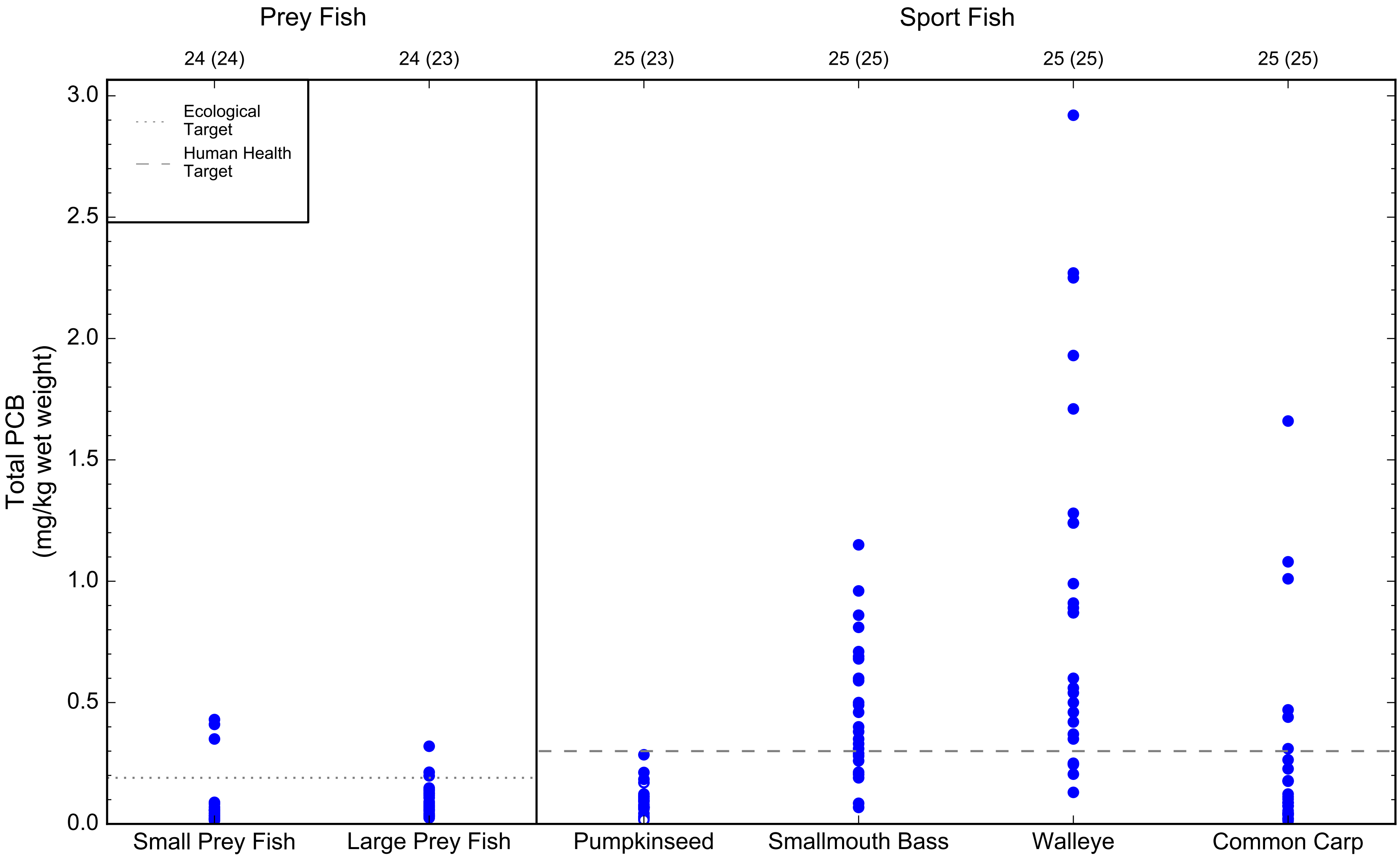


Figure 3.8

Scatter Plot of Total PCB Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Non-detects included at 1/2 RL. Open symbols indicate results were non-detect. TPCB is the sum of detected Aroclors. Small Prey Fish are whole-body composites, Large Prey Fish are individual whole-body samples, Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Targets are not performance criteria. Preliminary draft.

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_scatterplots.py 5/21/2019 11:27:26

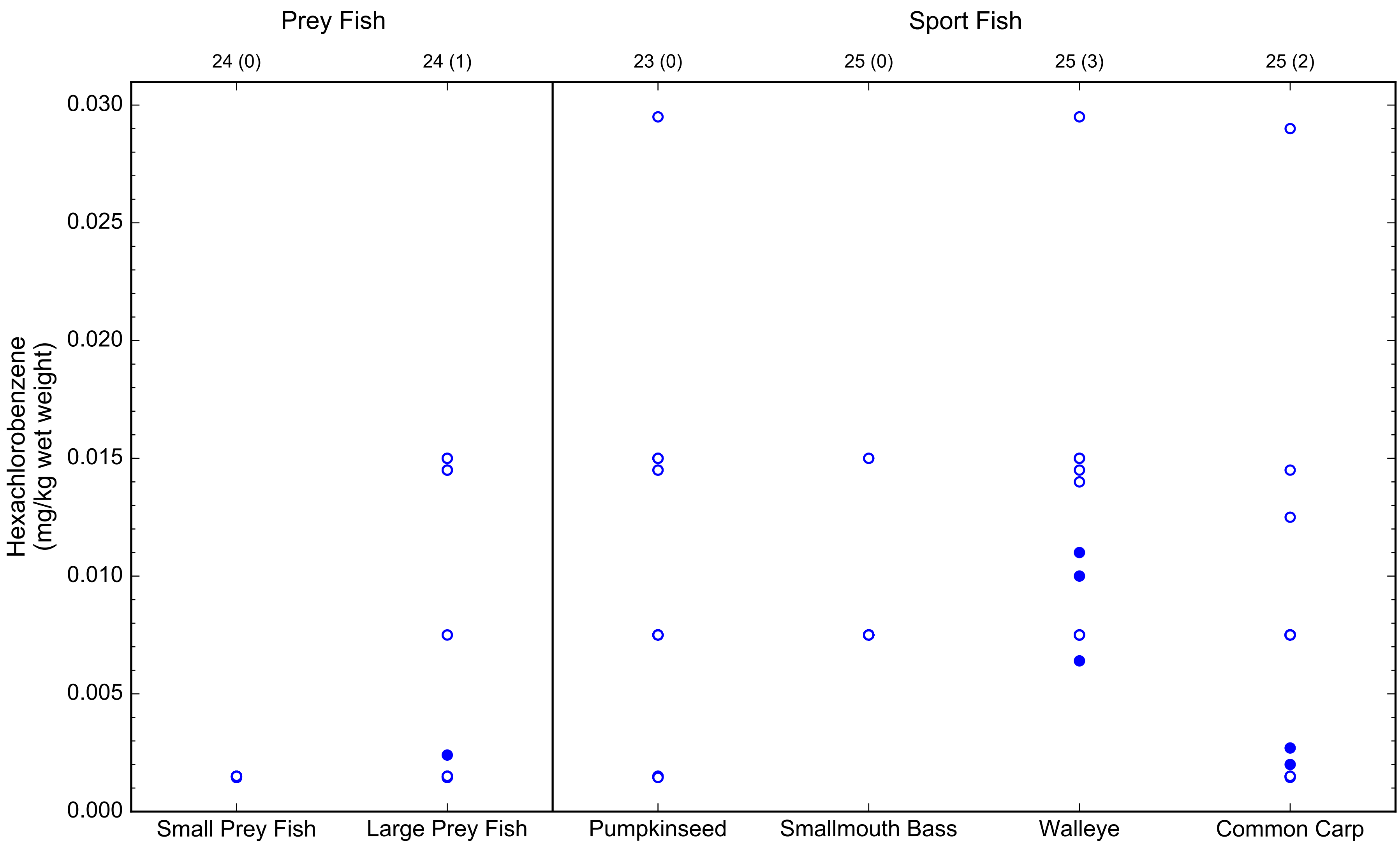


Figure 3.9

Scatter Plot of Hexachlorobenzene Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Non-detects included at 1/2 RL. Open symbols indicate results were non-detect. Small Prey Fish are whole-body composites, Large Prey Fish are individual whole-body samples, Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Preliminary draft.

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_scatterplots.py 5/21/2019 11:27:26

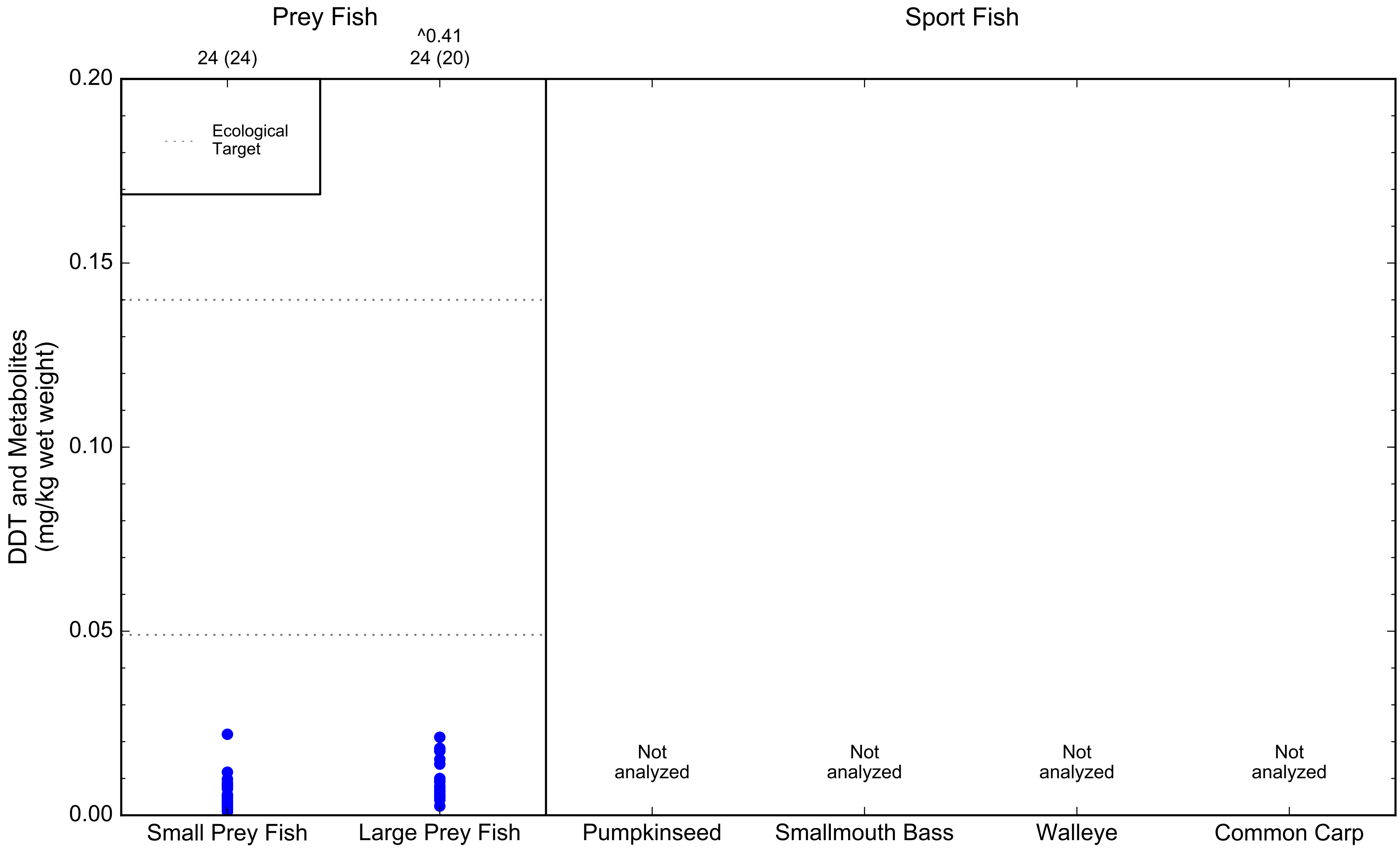


Figure 3.10

Scatter Plot of DDT and Metabolites Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. "^" indicates result value above axis range.
Non-detects included at 1/2 RL. Open symbols indicate results were non-detect.
Small Prey Fish are whole-body composites, Large Prey Fish are individual whole-body samples. Sport fish were not analyzed for DDT and Metabolites.
Targets are not performance criteria.
Preliminary draft.

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_scatterplots.py 5/21/2019 11:27:27

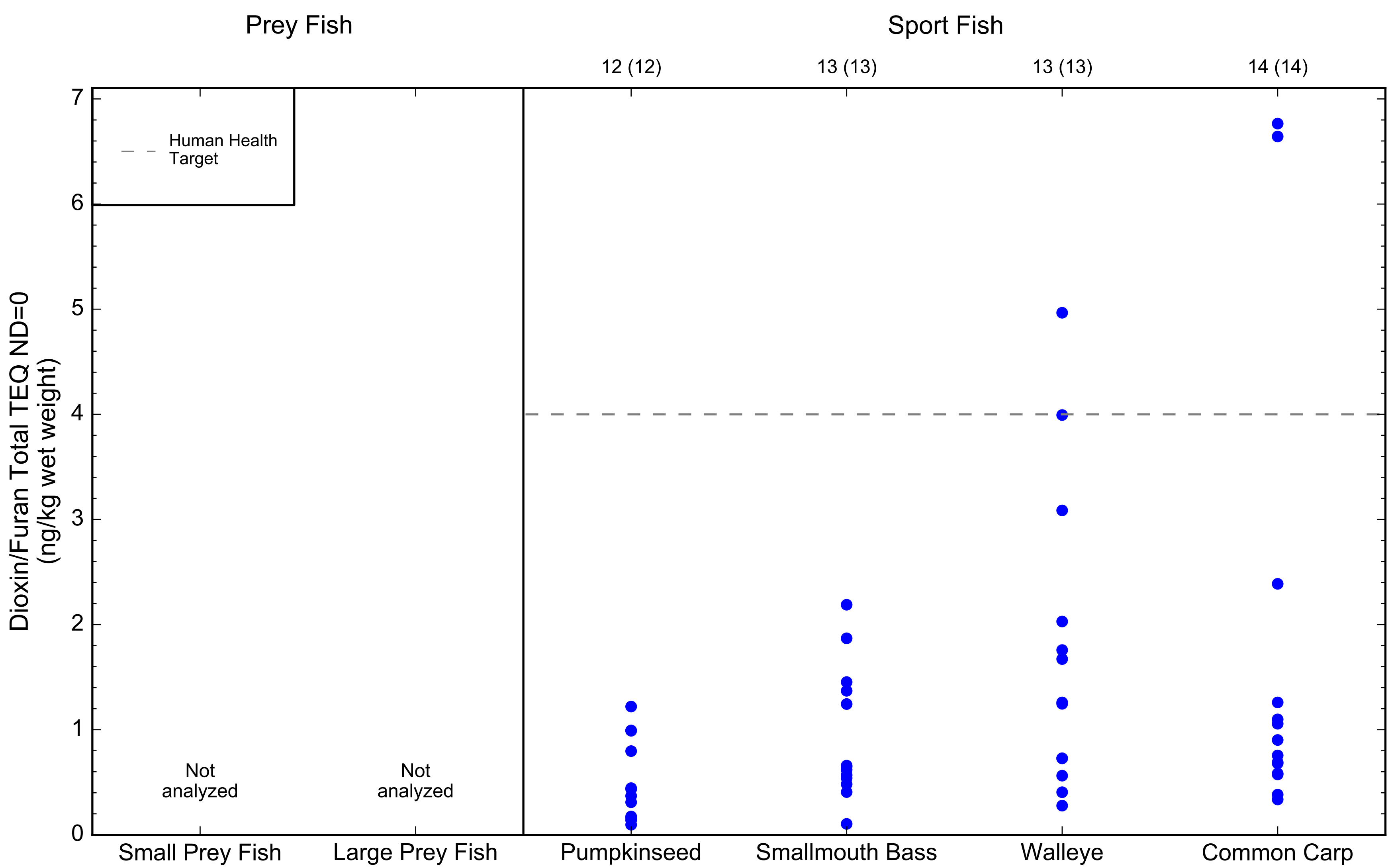


Figure 3.11

Scatter Plot of Dioxin/Furan Total TEQ (ND=0) Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Individual non-detects excluded from the Total TEQ calculation. If all individual congeners were not detected, the Total TEQ result is plotted at 0 with an open symbol. Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Small and large prey fish were not analyzed for dioxin/furans. Targets are not performance criteria. Preliminary draft.

ANCHOR QEA

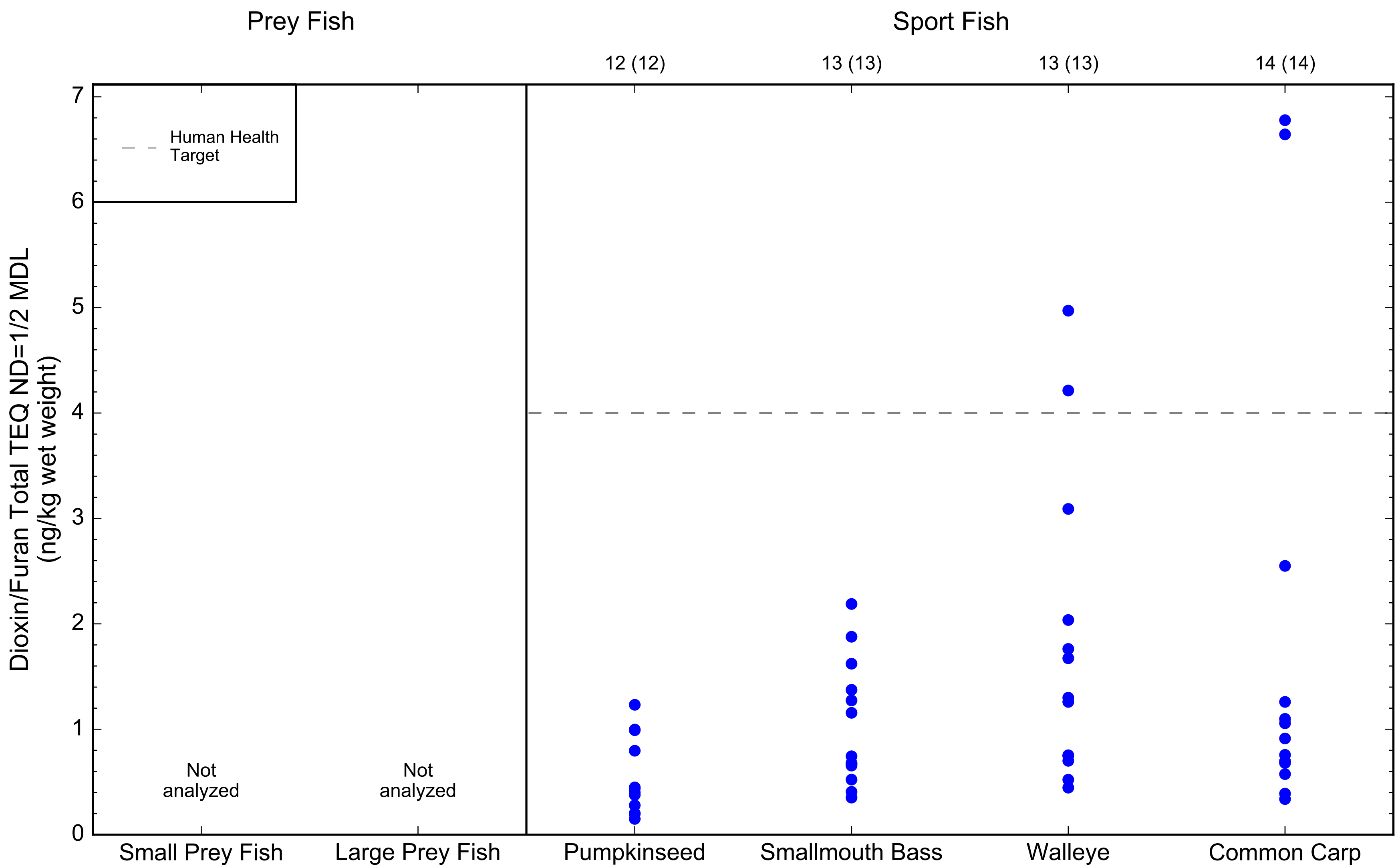
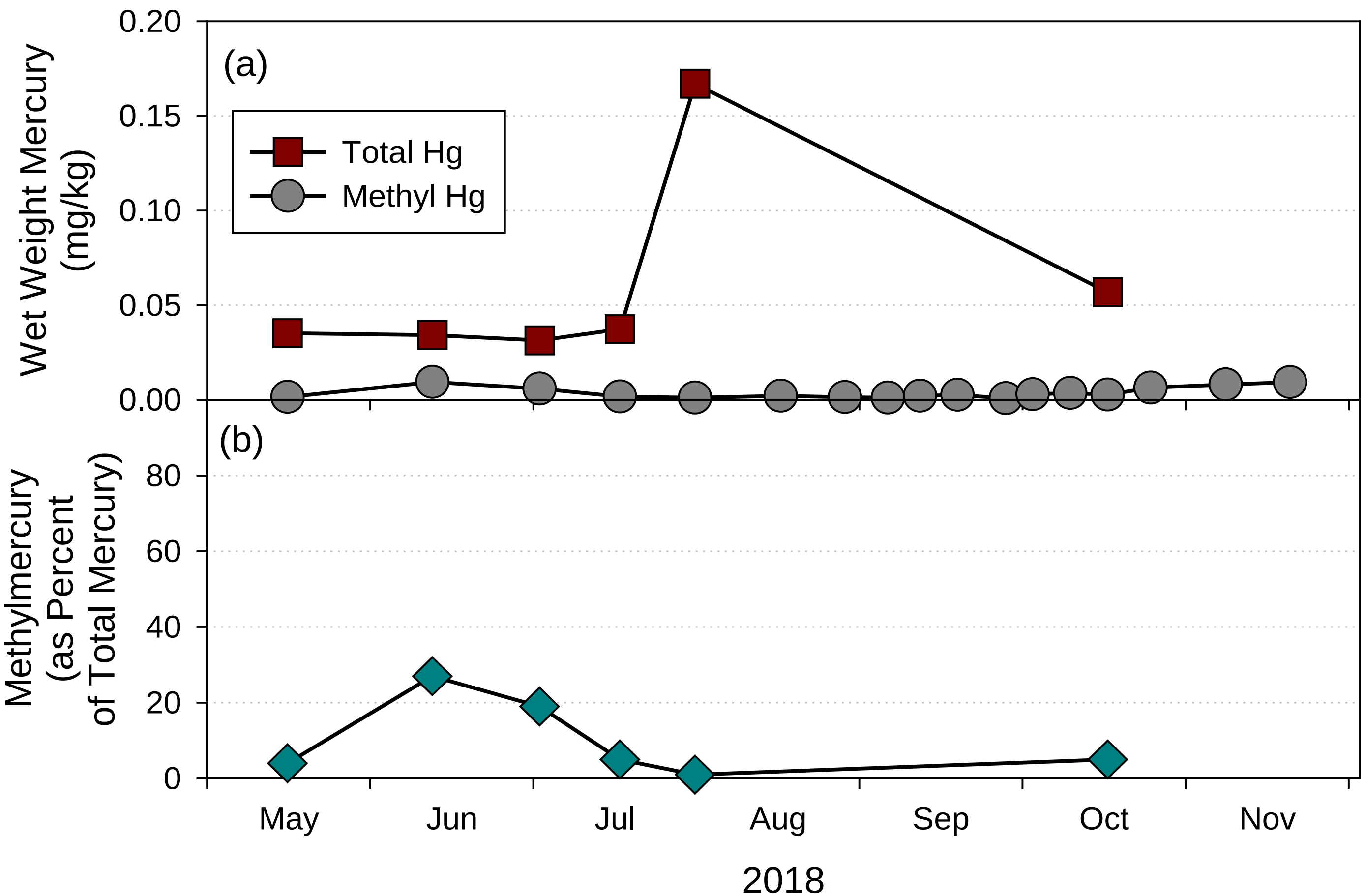


Figure 3.12

Scatter Plot of Dioxin/Furan Total TEQ (ND=1/2 MDL) Concentrations in Onondaga Lake Fish (2018)

Notes: Number of samples provided above the plot with number of detected results in parentheses. Individual non-detects included in the Total TEQ calculation at 1/2 the MDL. If all individual congeners were not detected, the Total TEQ result is plotted with an open symbol. Pumpkinseed, Smallmouth Bass, Walleye, and Common Carp are NYSDEC standard fillets. Small and large prey fish were not analyzed for dioxin/furans. Targets are not performance criteria. Preliminary draft.

SYR-MBEL - H:\D_Drive\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\ANALYSIS\FISH\2018_OMM\Python\Species_scatterplots.py 5/21/2019 11:27:27



(a) Total Mercury (Hg) and Methylmercury (MeHg), and
(b) Percentage Total Mercury Measured as Methylmercury

FIGURE 3.13

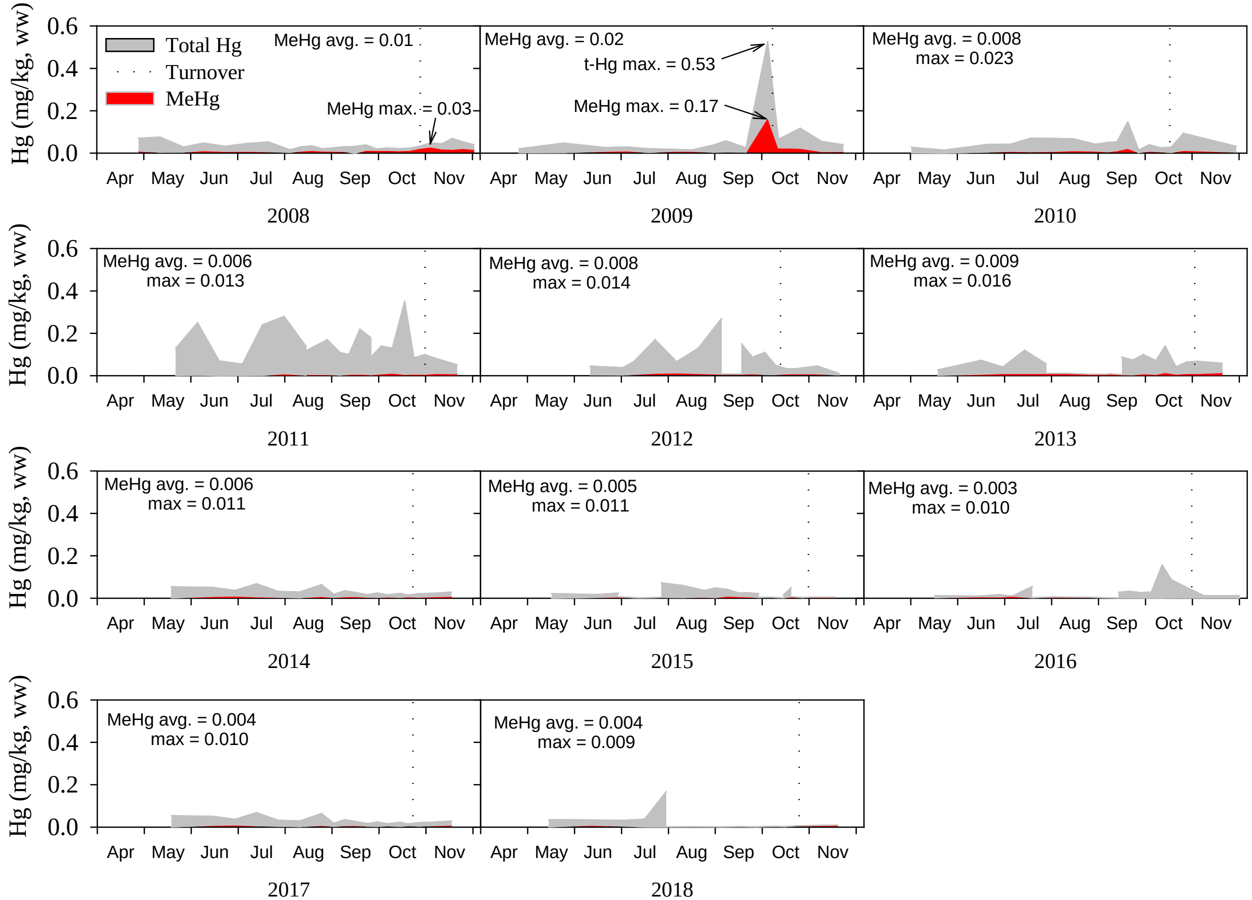
Honeywell

Onondaga Lake
Syracuse, New York

Wet Weight Mercury Concentrations in Zooplankton Collected from South Deep in 2018

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560



Note: The timing of fall turnover is indicated by vertical dashed lines.

FIGURE 3.14

Honeywell

Onondaga Lake
Syracuse, New York

Wet Weight Total Mercury and Methylmercury Concentrations in Zooplankton (2008-2018)

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560

Sport Fish

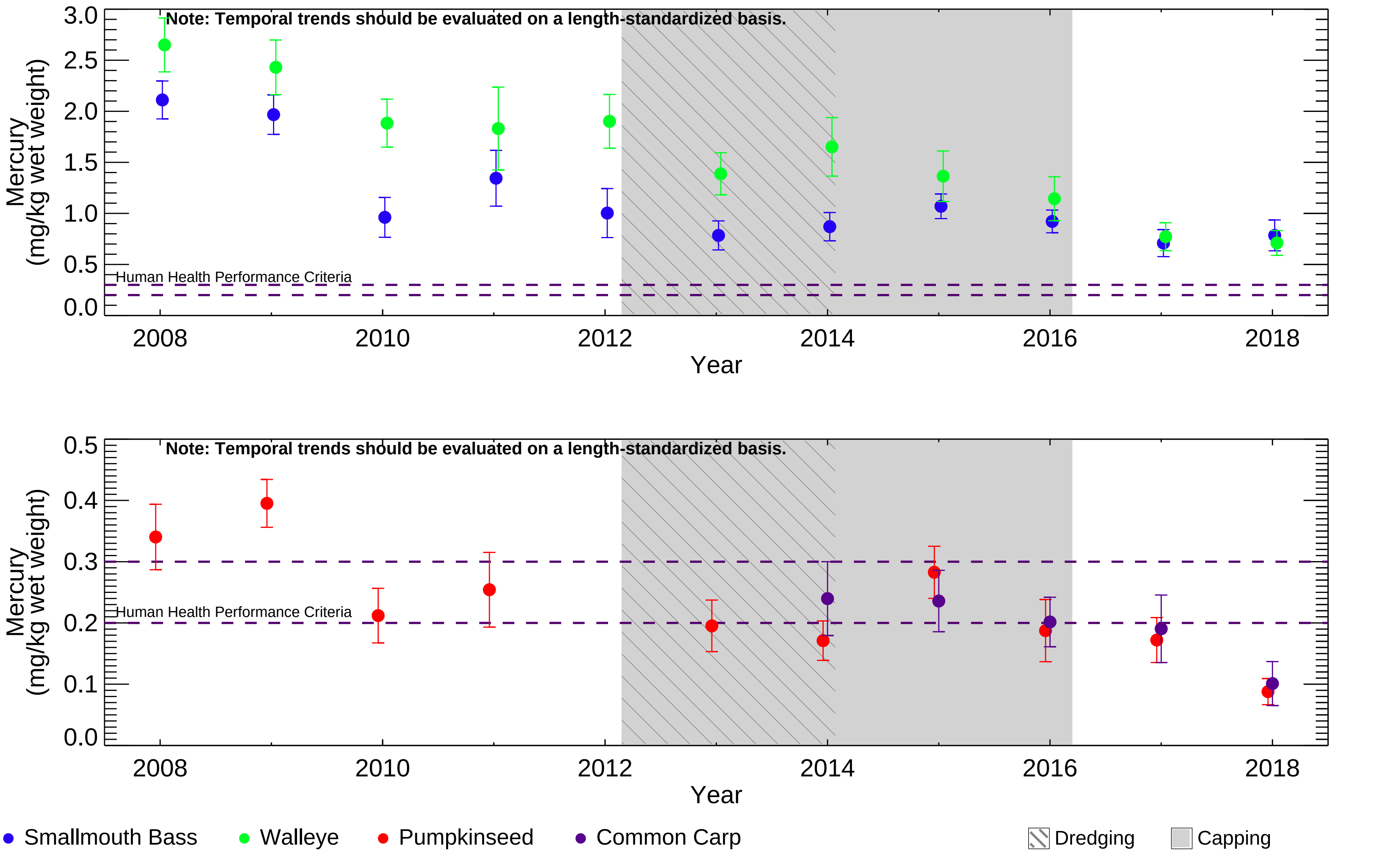


Figure 3.15

Temporal Profile of Mercury Concentrations in Onondaga Lake Sport Fish: 2008 to 2018

Notes: All fish are NYSDEC standard fillets.
Non-detects included at 1/2 MDL. Data presented are means +/- 2 SE; all ages and both sexes combined.
Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring.
In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012. Collection of Common Carp began in 2014.
Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Sportfish.pro Wed May 22 11:37:38 2019

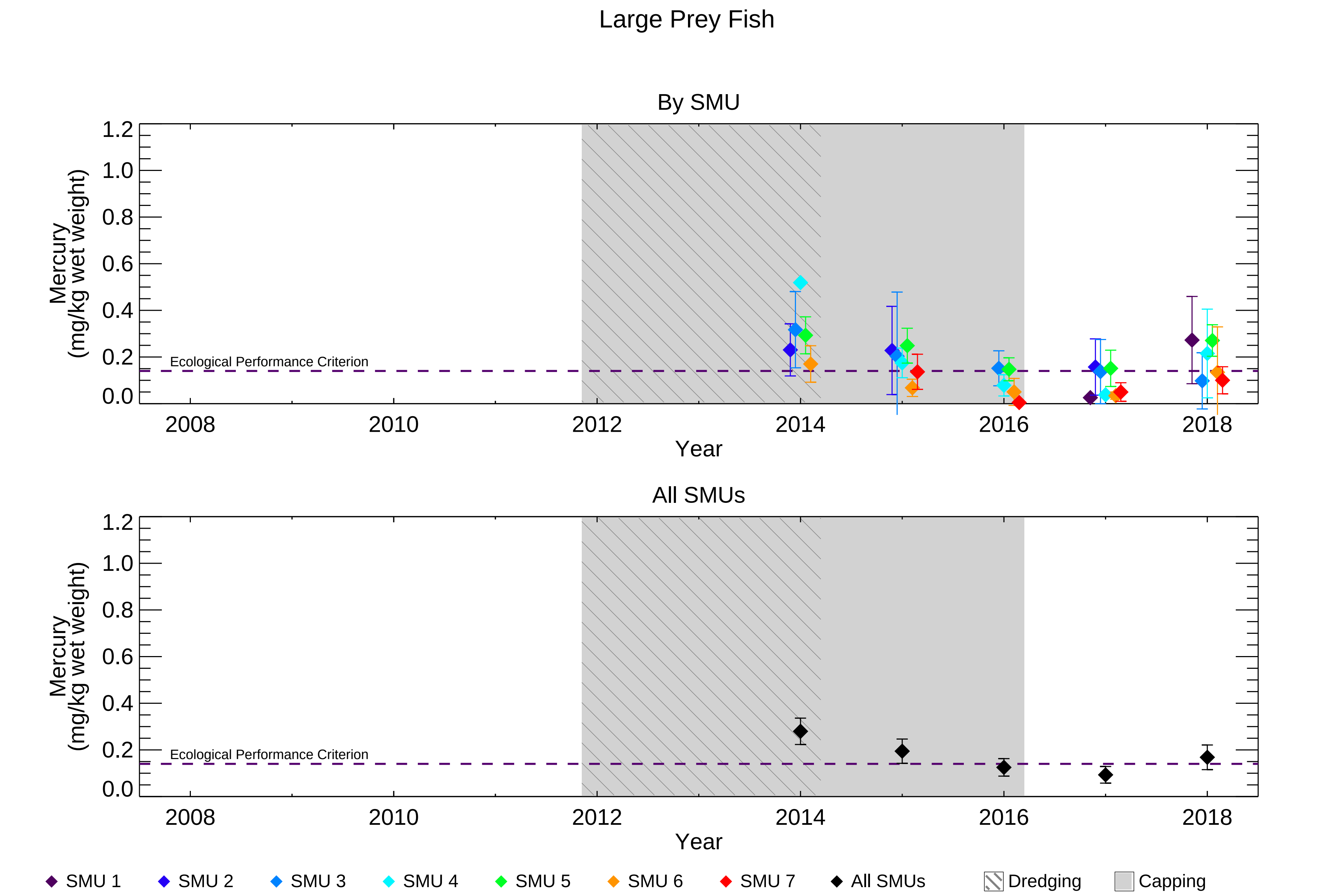


Figure 3.16

Temporal Profile of Mercury Concentrations in Onondaga Lake Large Prey Fish: 2008 to 2018

Notes: Large prey fish = White Sucker.
Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring.
Non-detects included at 1/2 MDL. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE.
In-lake remediation began in late July 2012. Large prey fish sampling began in 2014.
Preliminary draft.

ANCHOR QEA

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 11:38:29 2019

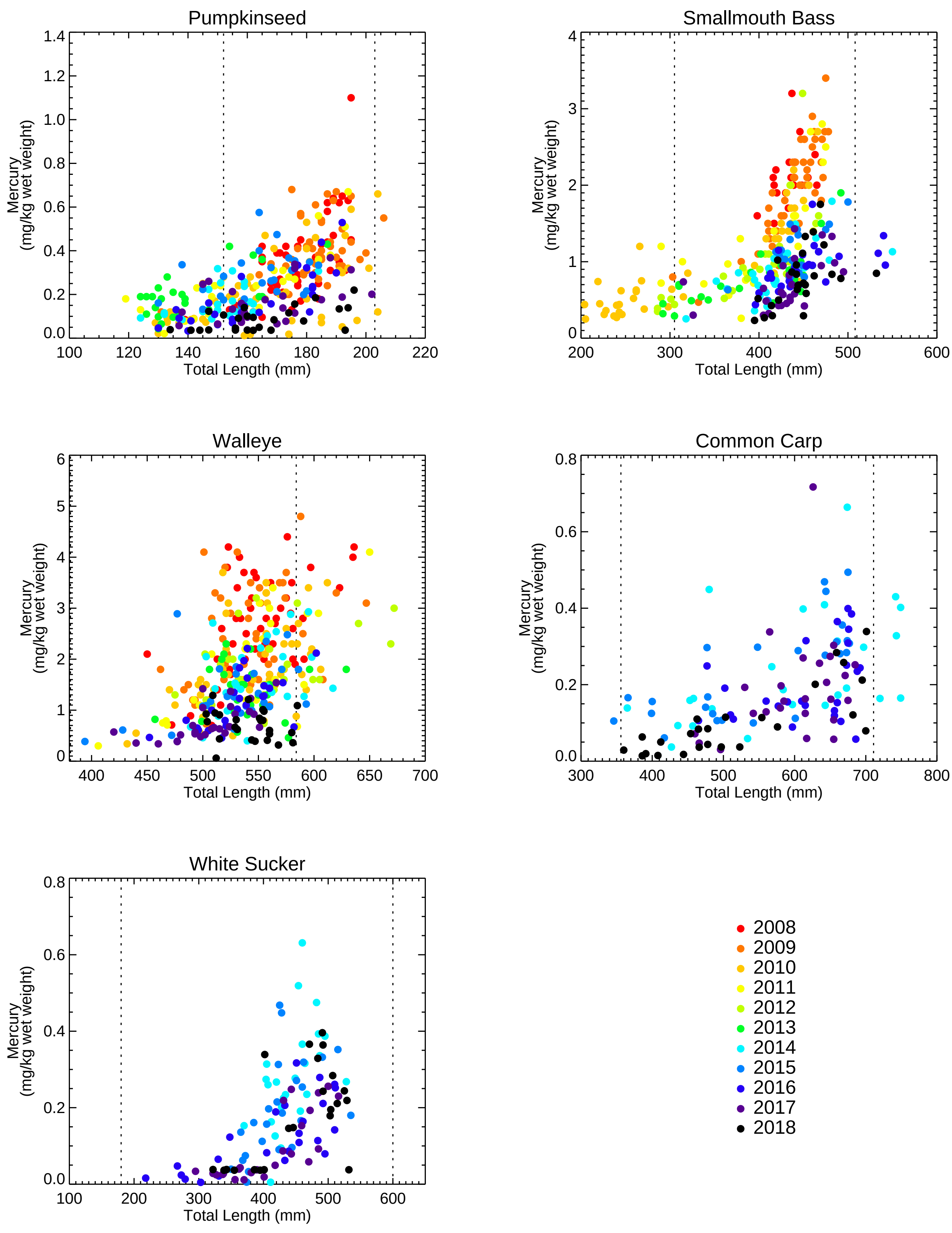


Figure 3.17

Mercury Concentrations versus Length in Onondaga Lake Fish: 2008 to 2018

Notes: Non-detects included at 1/2 MDL.
Dashed lines represent range of lengths targeted for collection. Collection of Common Carp began in 2014.
Data source: 2008 to 2011 Baseline Monitoring Program and 2012 to 2018 Remedial Goal Monitoring.
Preliminary draft.

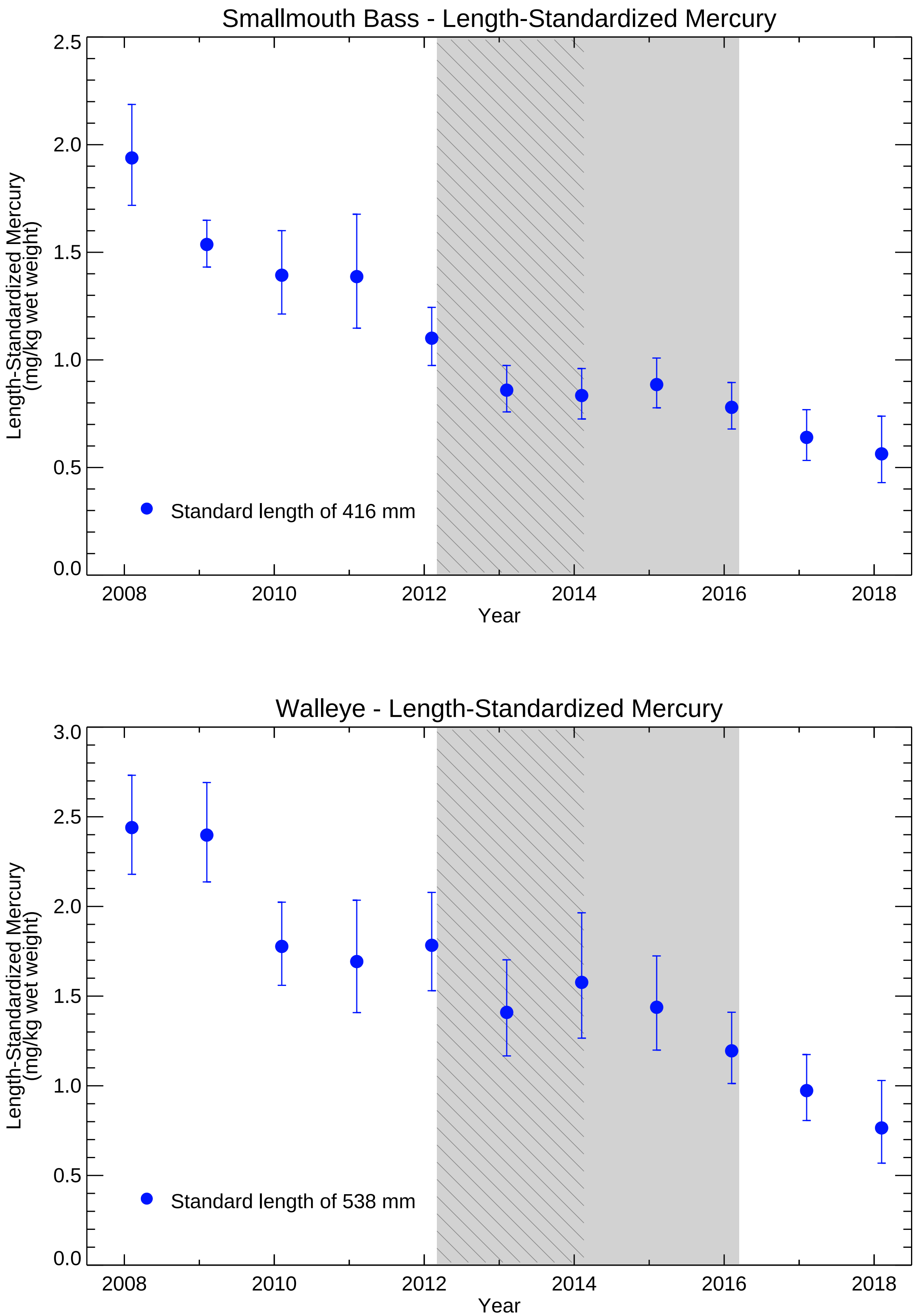
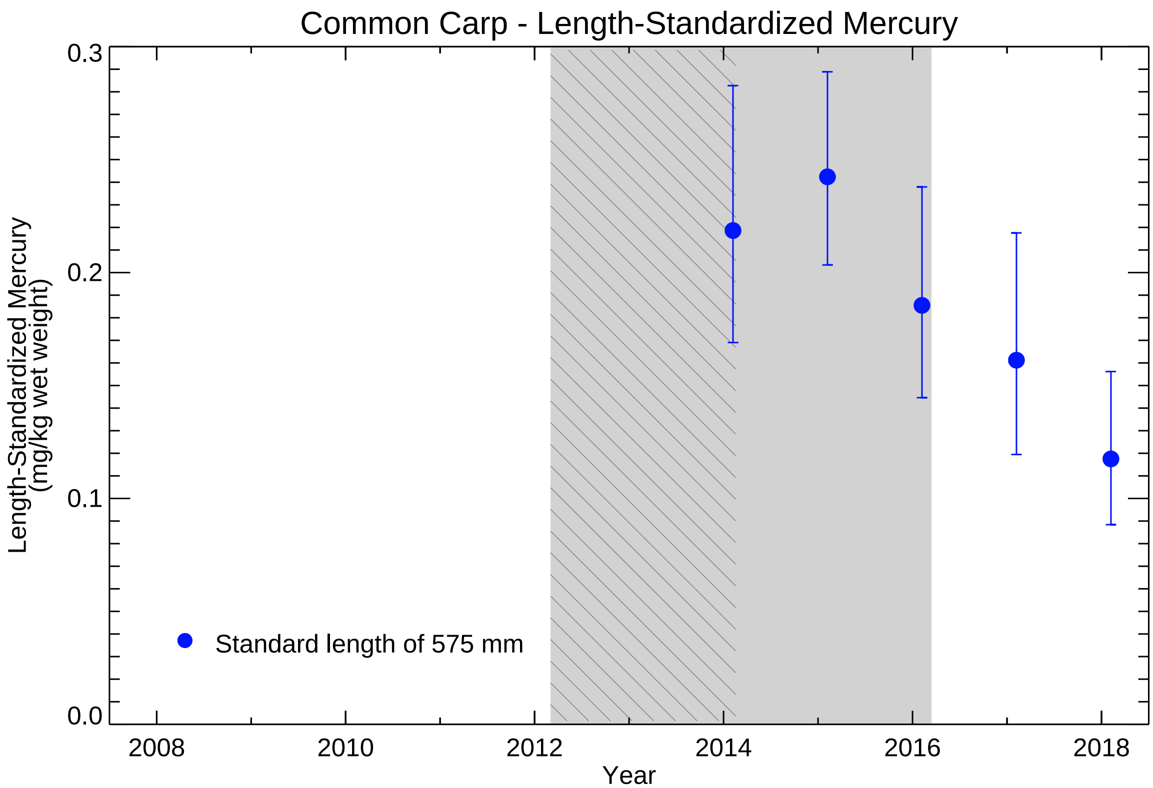


Figure 3.18

Length-Standardized Temporal Profile of Mercury Concentrations in Onondaga Lake
Smallmouth Bass and Walleye: 2008 to 2018

Notes: Fish are NYSDEC standard fillets. Standard length is average of yearly Onondaga Lake mean length. Non-detects included at 1/2 MDL. Data presented are means +/- 2 SE; all ages and both sexes combined. Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring. In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Hg_lenstd.pro Wed May 22 11:57:24 2019



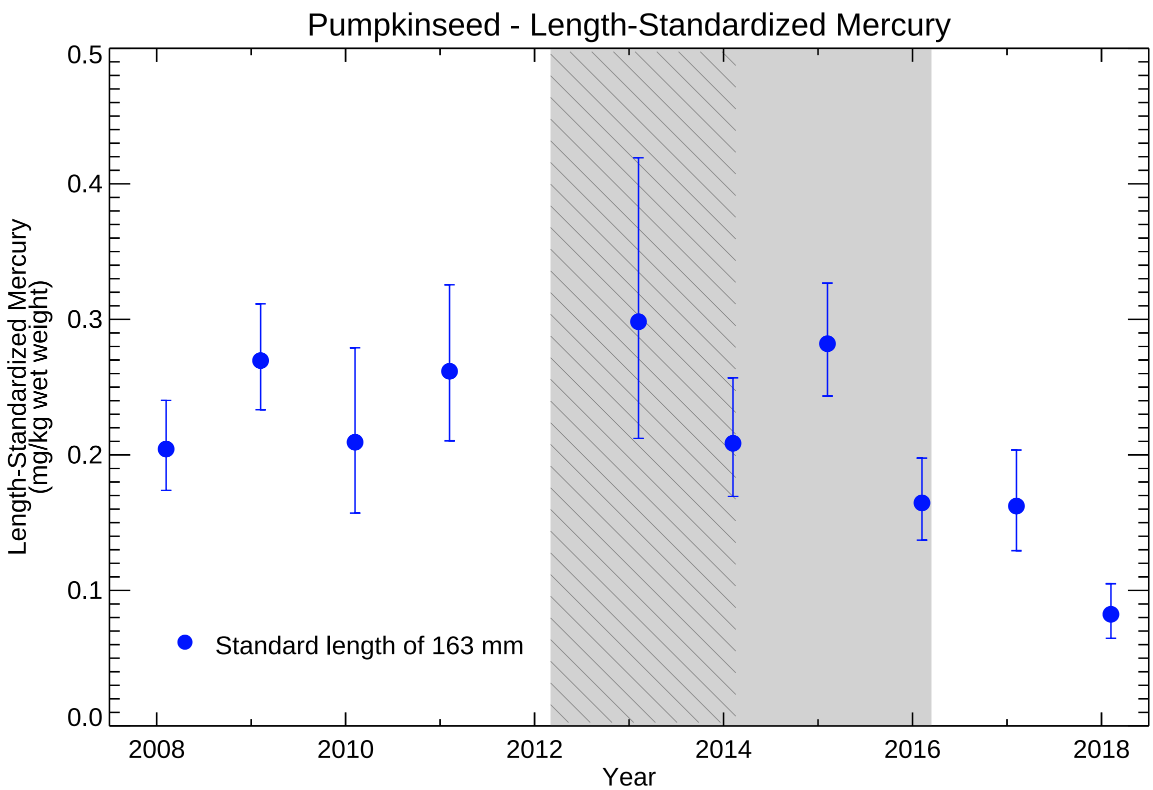


Figure 3.19

Length-Standardized Temporal Profile of Mercury Concentrations in Onondaga Lake
Pumpkinseed and Carp: 2008 to 2018

Notes: Fish are NYSDEC standard fillets. Standard length is average of yearly Onondaga Lake mean length. Non-detects included at 1/2 MDL. Data presented are means +/- 2 SE; all ages and both sexes combined. Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring. In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Hg_lenstd.pro Wed May 22 11:57:25 2019

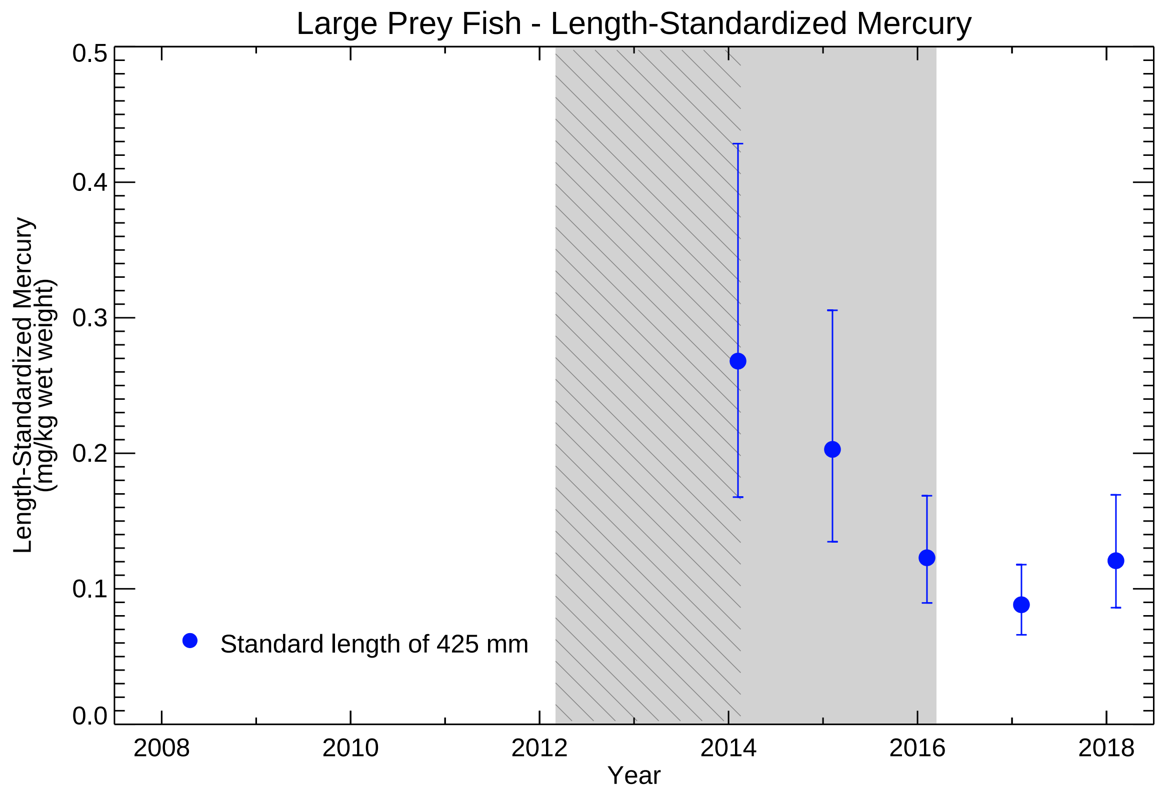


Figure 3.20

Length-Standardized Temporal Profile of Mercury Concentrations in Onondaga Lake
Large Prey Fish: 2008 to 2018

Notes: Fish are whole body. Standard length is average of yearly Onondaga Lake mean length.
Non-detects included at 1/2 MDL. Data presented are means +/- 2 SE; all ages and both sexes combined.
Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring.
In-lake remediation began in late July 2012. Large prey fish sampling began in 2014.
Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Hg_lenstd.pro Wed May 22 11:57:25 2019

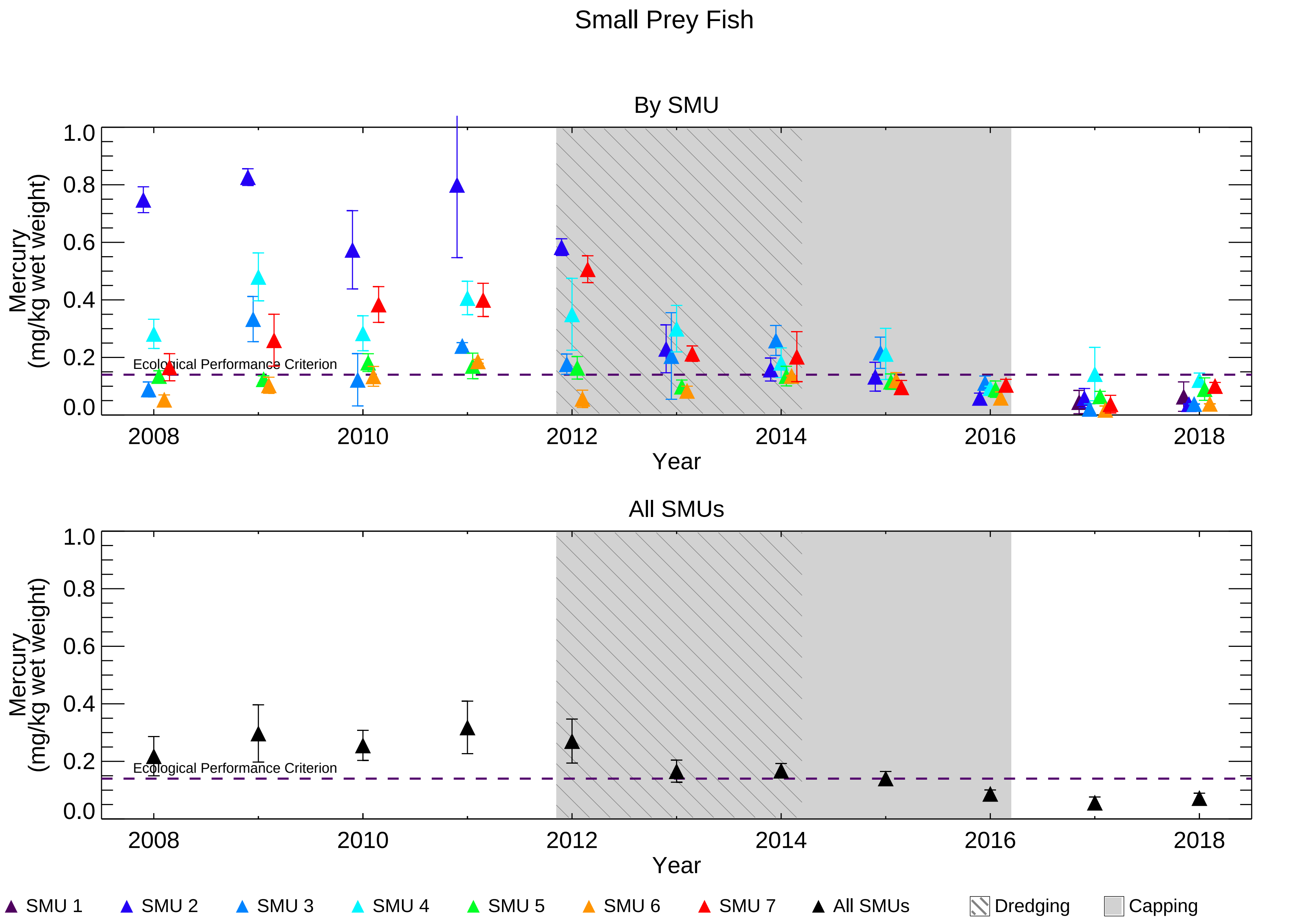


Figure 3.21

Temporal Profile of Mercury Concentrations in Onondaga Lake Small Prey Fish: 2008 to 2018

Notes: Small prey fish = Golden Shiner, Brook Silverside, Minnow, Bluntnose Minnow, Banded Killifish, and Round Goby (Alewife excluded).
Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring.
Non-detects included at 1/2 MDL. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE.
In 2012, in-lake remediation began in late July and fish were sampled in early August 2012.
Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 11:38:24 2019

Smallmouth Bass and Walleye

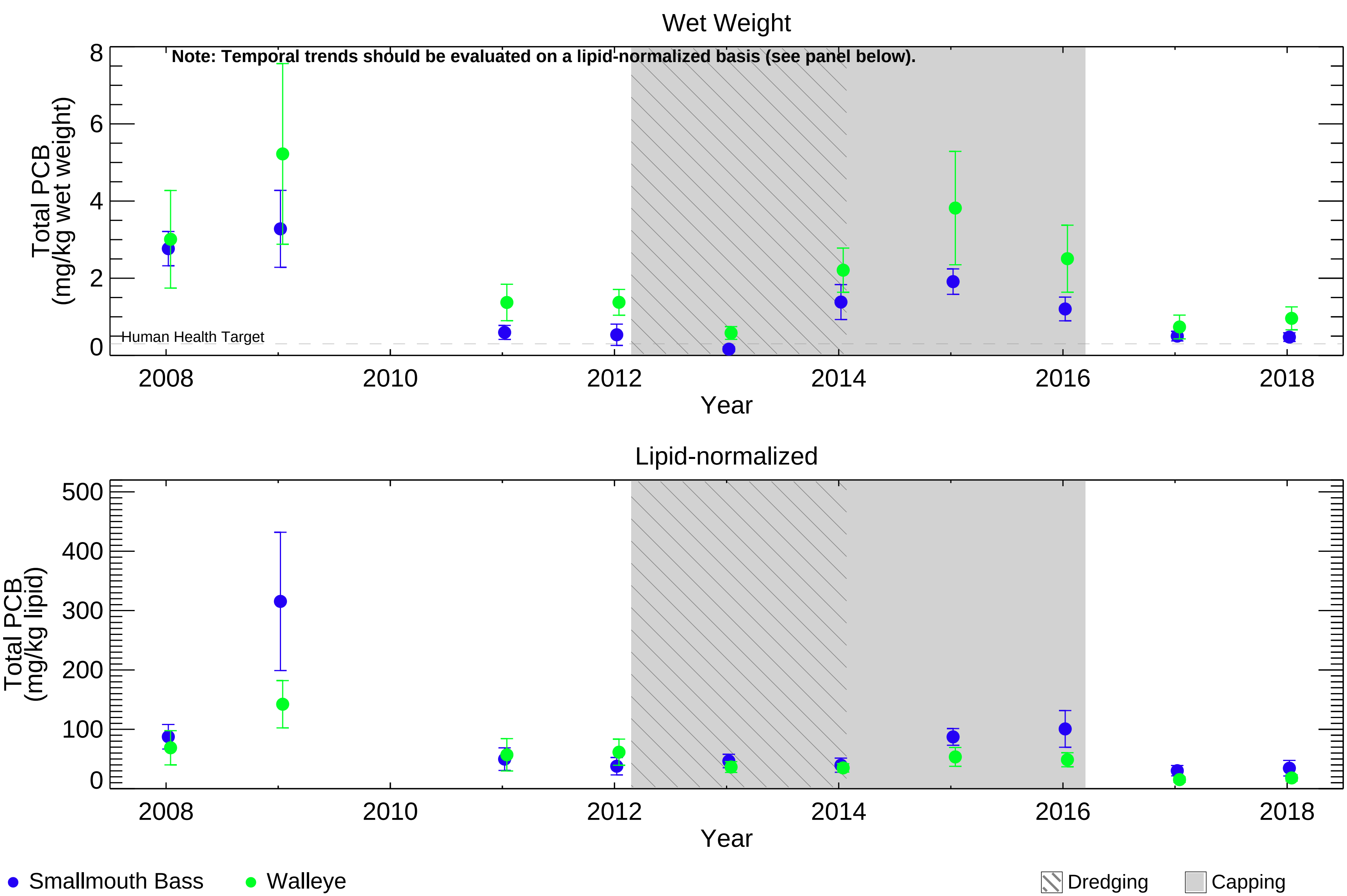


Figure 3.22

Temporal Profile of Total PCB Concentrations in Onondaga Lake Smallmouth Bass and Walleye: 2008 to 2018

ANCHOR QEA

Notes: All fish are NYSDEC standard fillets. TPCB is the sum of detected Aroclors. 2010 organics data are excluded from long-term trends.
Non-detects included at 1/2 RL. Data presented are means +/- 2 SE; all ages and both sexes combined.
Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring.
In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012.
Targets are not performance criteria. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Sportfish.pro Wed May 22 11:37:39 2019

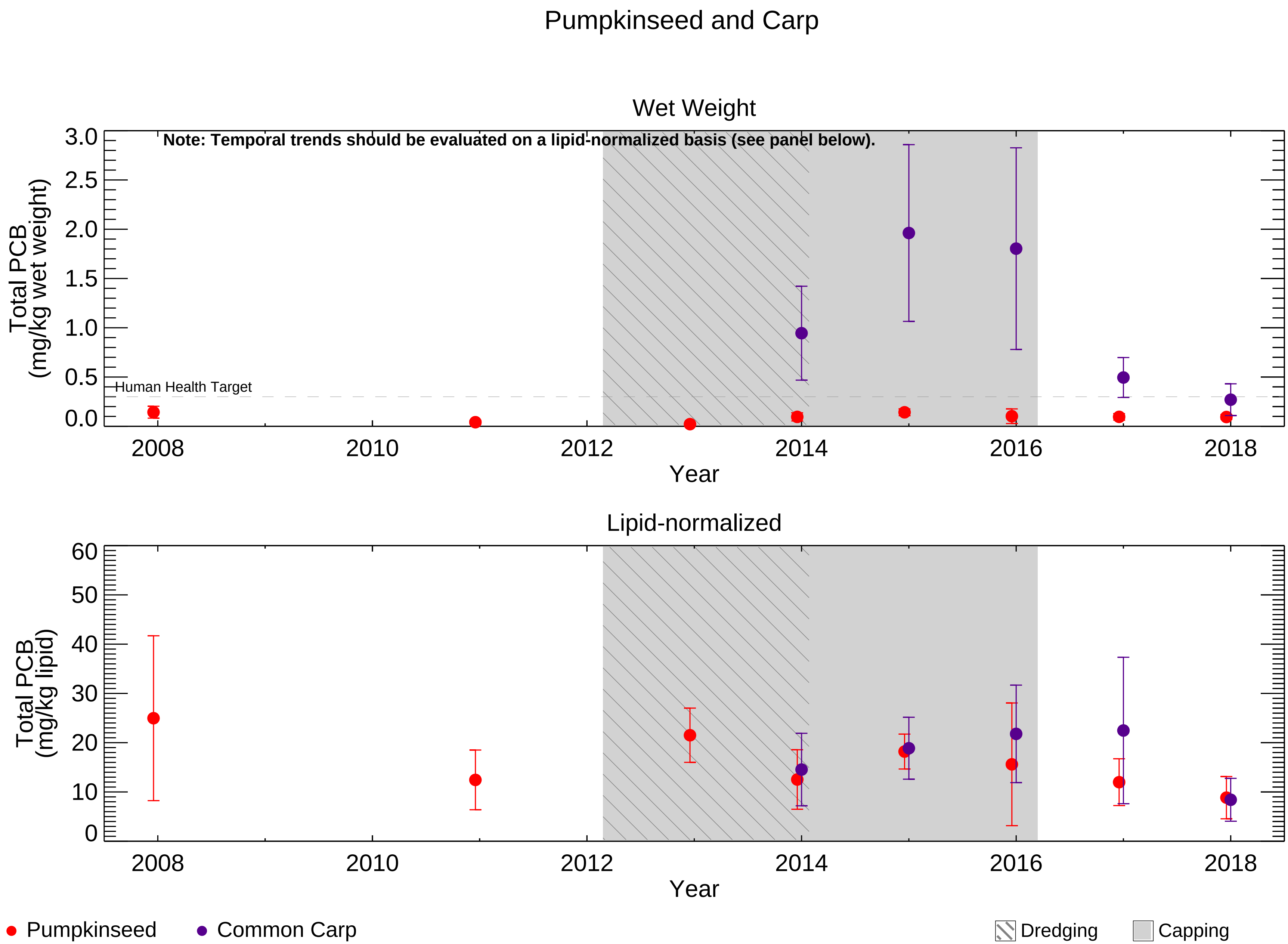


Figure 3.23

Temporal Profile of Total PCB Concentrations in Onondaga Lake Pumpkinseed and Carp: 2008 to 2018

Notes: All fish are NYSDEC standard fillets. TPCB is the sum of detected Aroclors. 2010 organics data are excluded from long-term trends. Non-detects included at 1/2 RL. Data presented are means +/- 2 SE; all ages and both sexes combined. Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring. In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012. Collection of Common Carp began in 2014. Targets are not performance criteria. Preliminary draft.

Large Prey Fish

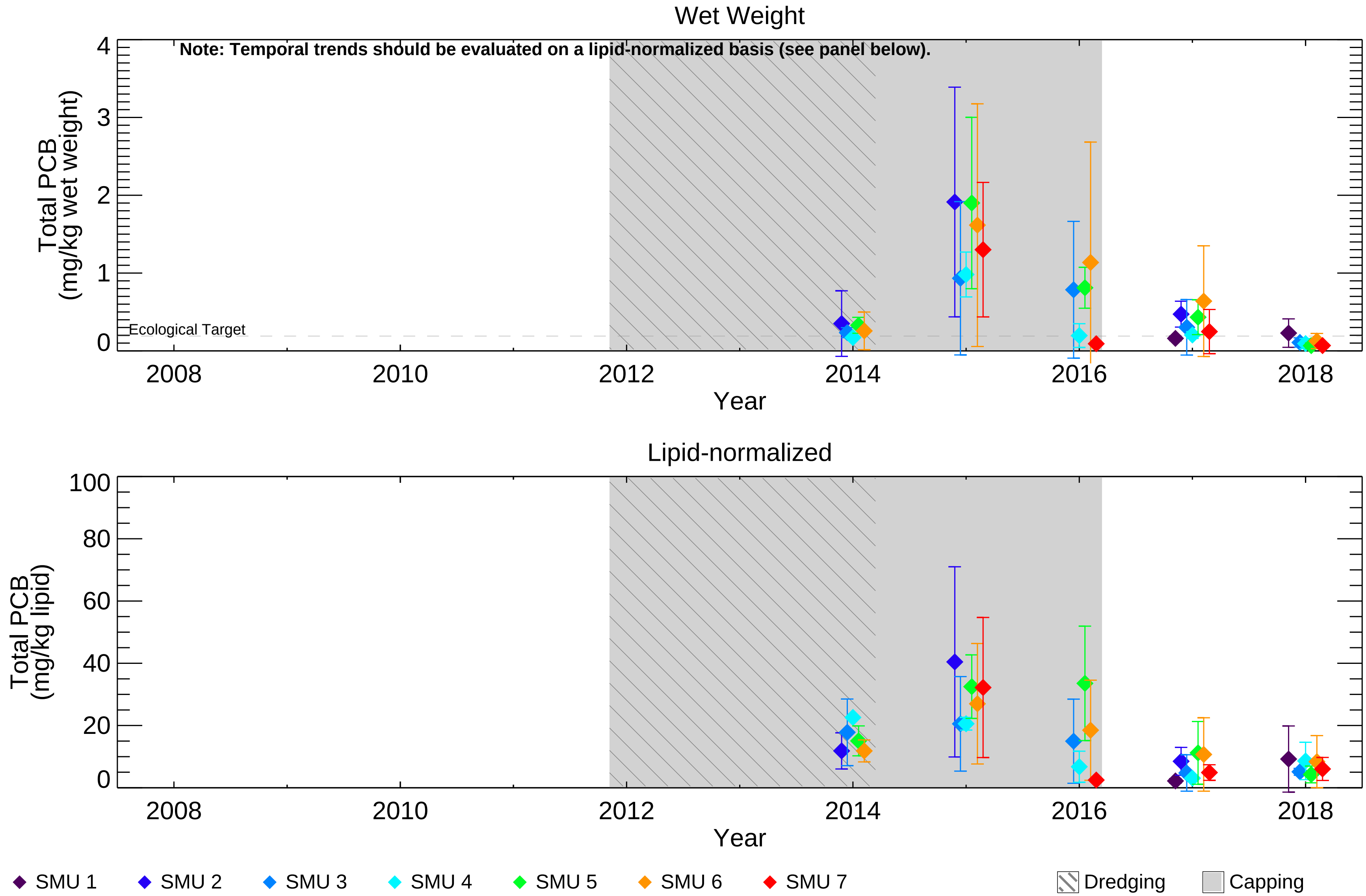


Figure 3.24

Temporal Profile of Total PCB Concentrations in Onondaga Lake Large Prey Fish: 2008 to 2018

Notes: Large prey fish = White Sucker.
Targets are not performance criteria. Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring.
TPCB is the sum of detected Aroclors. Non-detects included at 1/2 RL. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE.
In-lake remediation began in late July 2012. Large prey fish sampling began in 2014.
Preliminary draft.

ANCHOR QEA

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 12:17:53 2019

Small Prey Fish

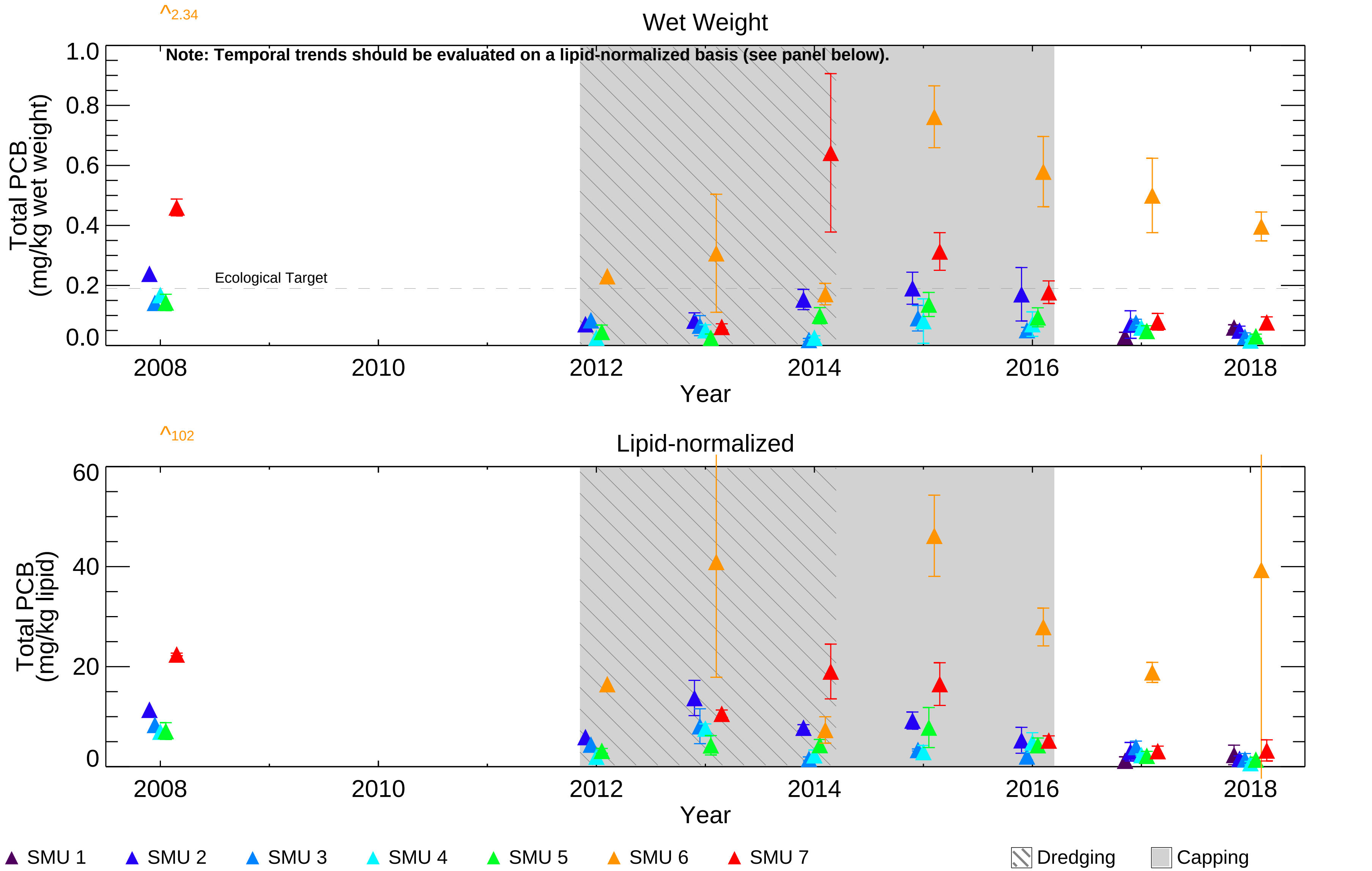


Figure 3.25

Temporal Profile of Total PCB Concentrations in Onondaga Lake Small Prey Fish: 2008 to 2018

Notes: Small prey fish = Golden Shiner, Minnow, Bluntnose Minnow, Banded Killifish, and Round Goby (Alewife excluded). Targets are not performance criteria. Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring. TPCB is the sum of detected Aroclors. Non-detects included at 1/2 RL. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE. In 2012, in-lake remediation began in late July and fish were sampled in early August 2012. 2010 organics data are excluded from long-term trends. Preliminary draft.

ANCHOR QEA

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 12:17:51 2019

Smallmouth Bass and Walleye

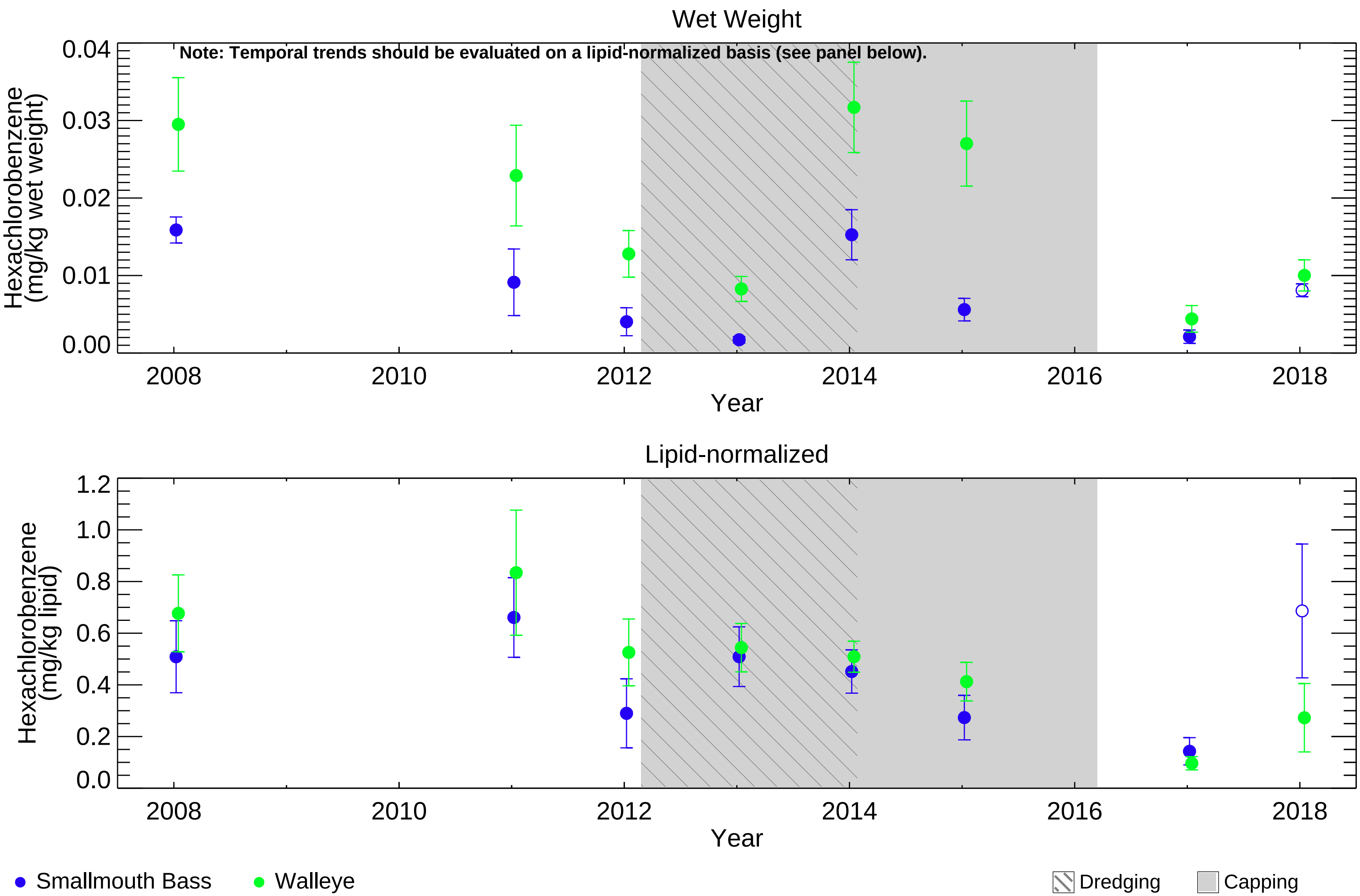


Figure 3.26

Temporal Profile of Hexachlorobenzene Concentrations in Onondaga Lake Smallmouth Bass and Walleye: 2008 to 2018

Notes: All fish are NYSDEC standard fillets. 2010 organics data are excluded from long-term trends.
Non-detects included at 1/2 RL. Open symbols indicate all results were non-detect. Data presented are means +/- 2 SE; all ages and both sexes combined.
Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring.
In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012.
Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Sportfish.pro Wed May 22 11:37:39 2019

Pumpkinseed and Carp

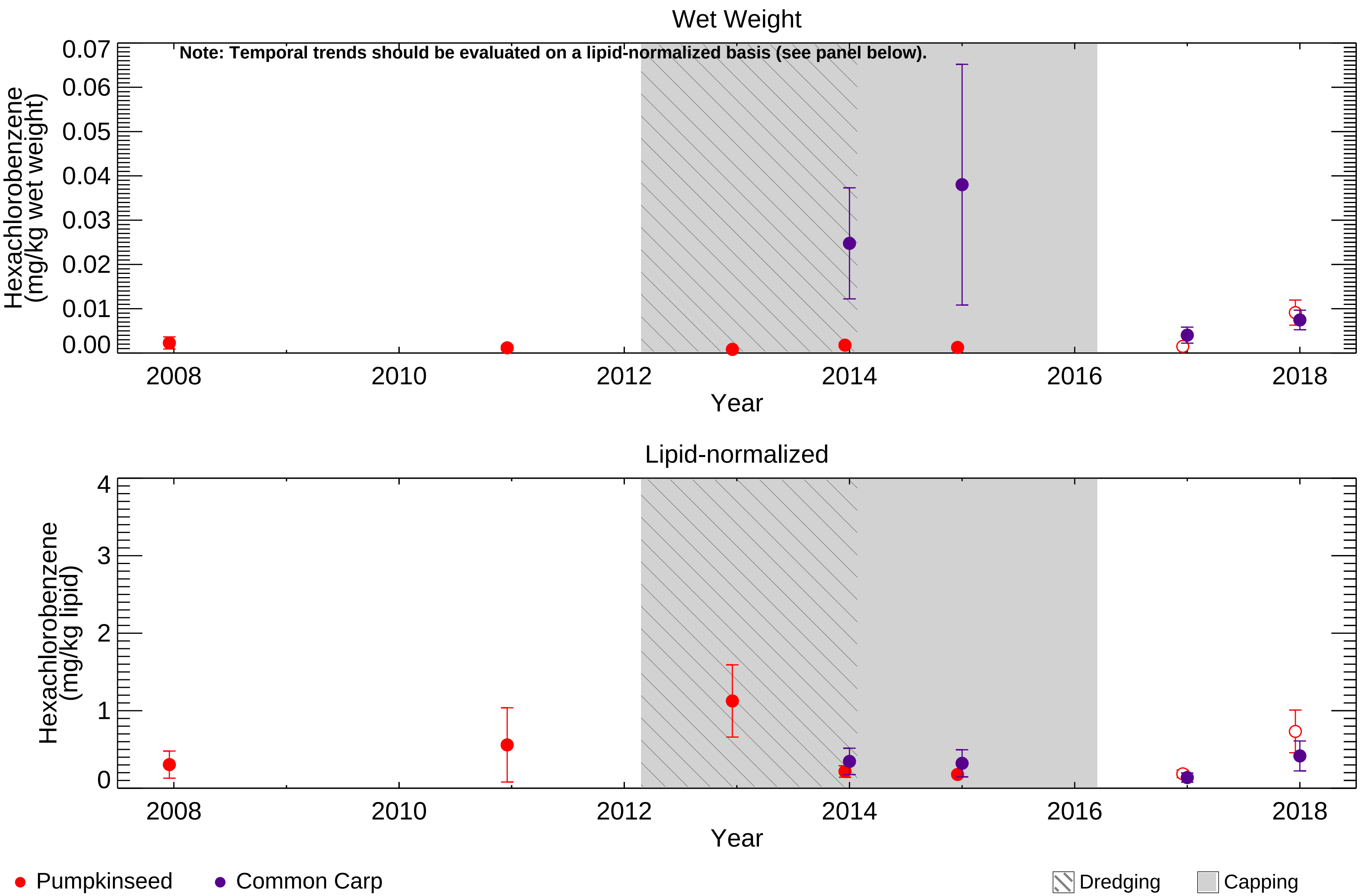


Figure 3.27

Temporal Profile of Hexachlorobenzene Concentrations in Onondaga Lake Pumpkinseed and Carp: 2008 to 2018

Notes: All fish are NYSDEC standard fillets. 2010 organics data are excluded from long-term trends.
Non-detects included at 1/2 RL. Open symbols indicate all results were non-detect. Data presented are means +/- 2 SE; all ages and both sexes combined.
Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring.
In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012. Collection of Common Carp began in 2014.
Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Sportfish.pro Wed May 22 11:37:39 2019

Large Prey Fish

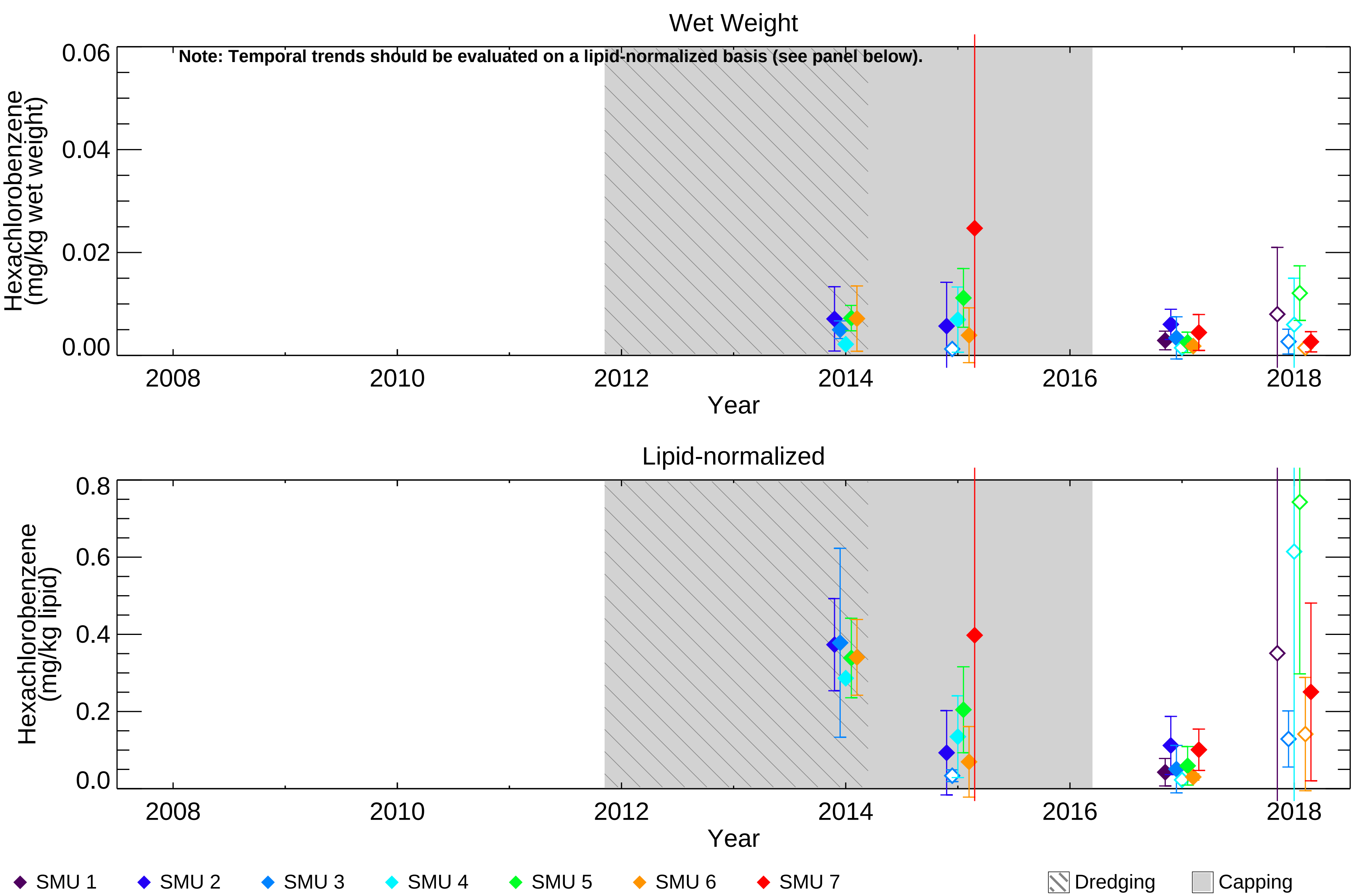


Figure 3.28

Temporal Profile of Hexachlorobenzene Concentrations in Onondaga Lake Large Prey Fish: 2008 to 2018

ANCHOR QEA

Notes: Large prey fish = White Sucker.
Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring. Non-detects included at 1/2 RL.
Open symbols indicate all results were non-detect. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE.
In-lake remediation began in late July 2012. Large prey fish sampling began in 2014.
Hexachlorobenzene is not analyzed in fish tissue on an annual basis, and was not analyzed in 2016. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 12:17:54 2019

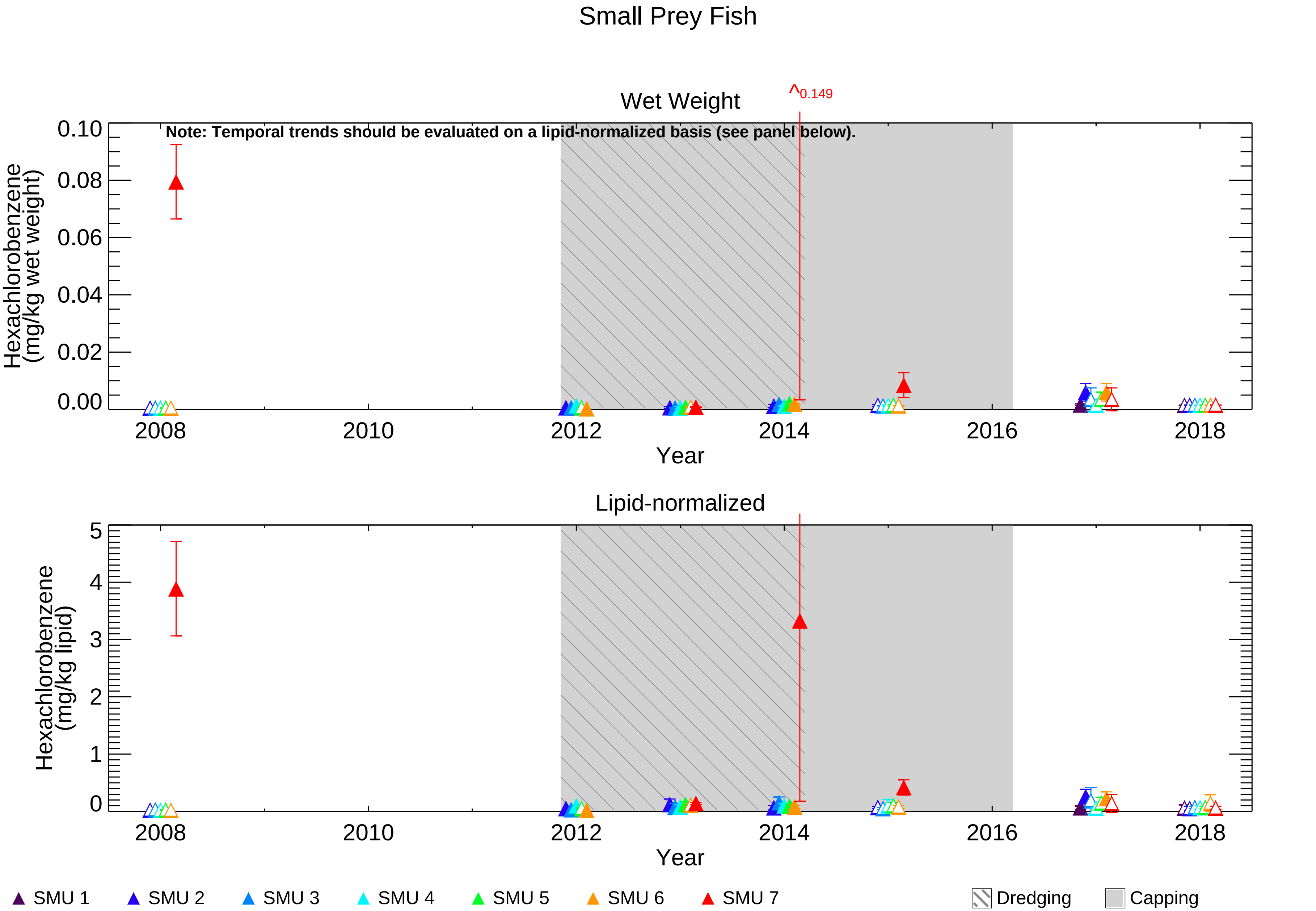


Figure 3.29

Temporal Profile of Hexachlorobenzene Concentrations in Onondaga Lake Small Prey Fish: 2008 to 2018

Notes: Small prey fish = Golden Shiner, Minnow, Bluntnose Minnow, Banded Killifish, and Round Goby (Alewife excluded).
Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring. Non-detects included at 1/2 RL.
Open symbols indicate all results were non-detect. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE.
In 2012, in-lake remediation began in late July and fish were sampled in early August 2012. 2010 organics data are excluded from long-term trends.
Hexachlorobenzene is not analyzed in fish tissue on an annual basis, and was not analyzed in 2016. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 12:17:51 2019

Smallmouth Bass and Walleye

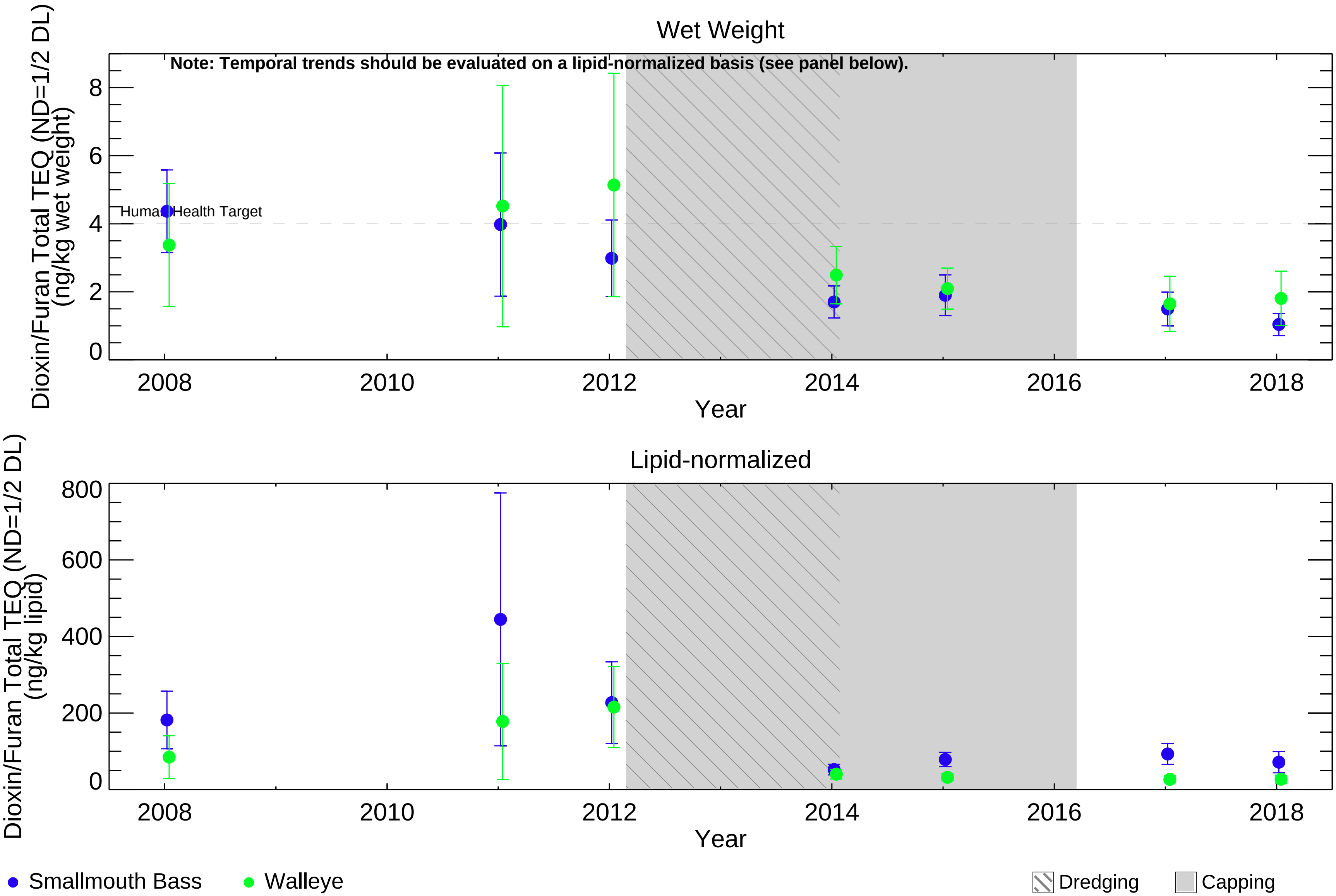


Figure 3.30

Temporal Profile of Dioxin/Furan Total TEQ Concentrations in Onondaga Lake Smallmouth Bass and Walleye: 2008 to 2018

ANCHOR QEA

Notes: All fish are NYSDEC standard fillets. 2010 organics data are excluded from long-term trends.
Non-detects summed at 1/2 MDL, except 2014 and 2015, which used 1/2 RL. Data presented are means +/- 2 SE; all ages and both sexes combined.
Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring.
In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012.
Targets are not performance criteria. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Sportfish.pro Wed May 22 11:37:40 2019

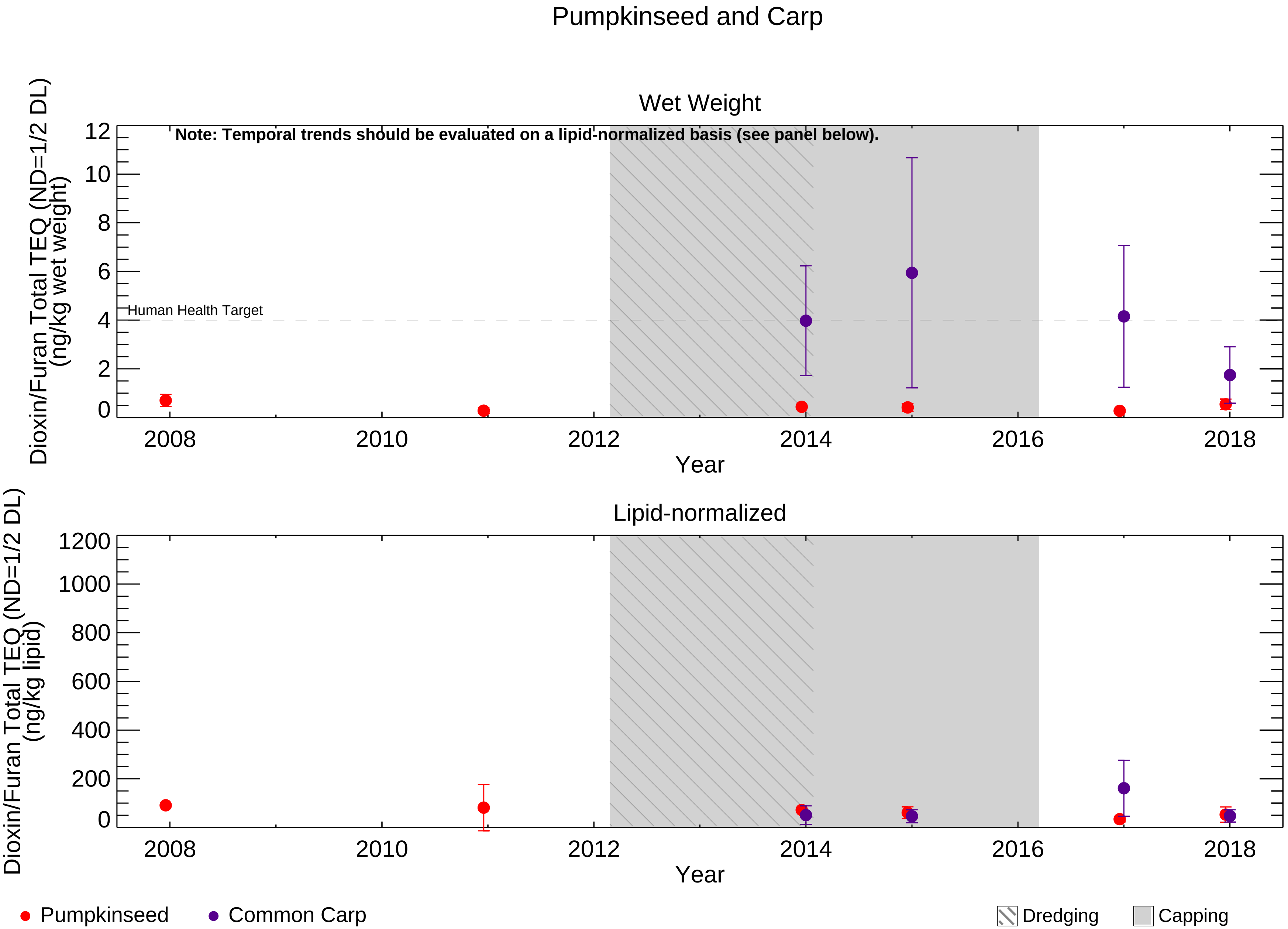


Figure 3.31

Temporal Profile of Dioxin/Furan Total TEQ Concentrations in Onondaga Lake Pumpkinseed and Carp: 2008 to 2018

Notes: All fish are NYSDEC standard fillets. 2010 organics data are excluded from long-term trends.
Non-detects summed at 1/2 MDL, except 2014 and 2015, which used 1/2 RL. Data presented are means +/- 2 SE; all ages and both sexes combined.
Data source: 2008 through 2011 Baseline Monitoring Program and 2012 through 2018 Remedial Goal Monitoring.
In 2012, in-lake remediation began in late July and fish were sampled mid-June through early-July 2012. Collection of Common Carp began in 2014.
Targets are not performance criteria. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_avg_Sportfish.pro Wed May 22 11:37:40 2019

Large Prey Fish

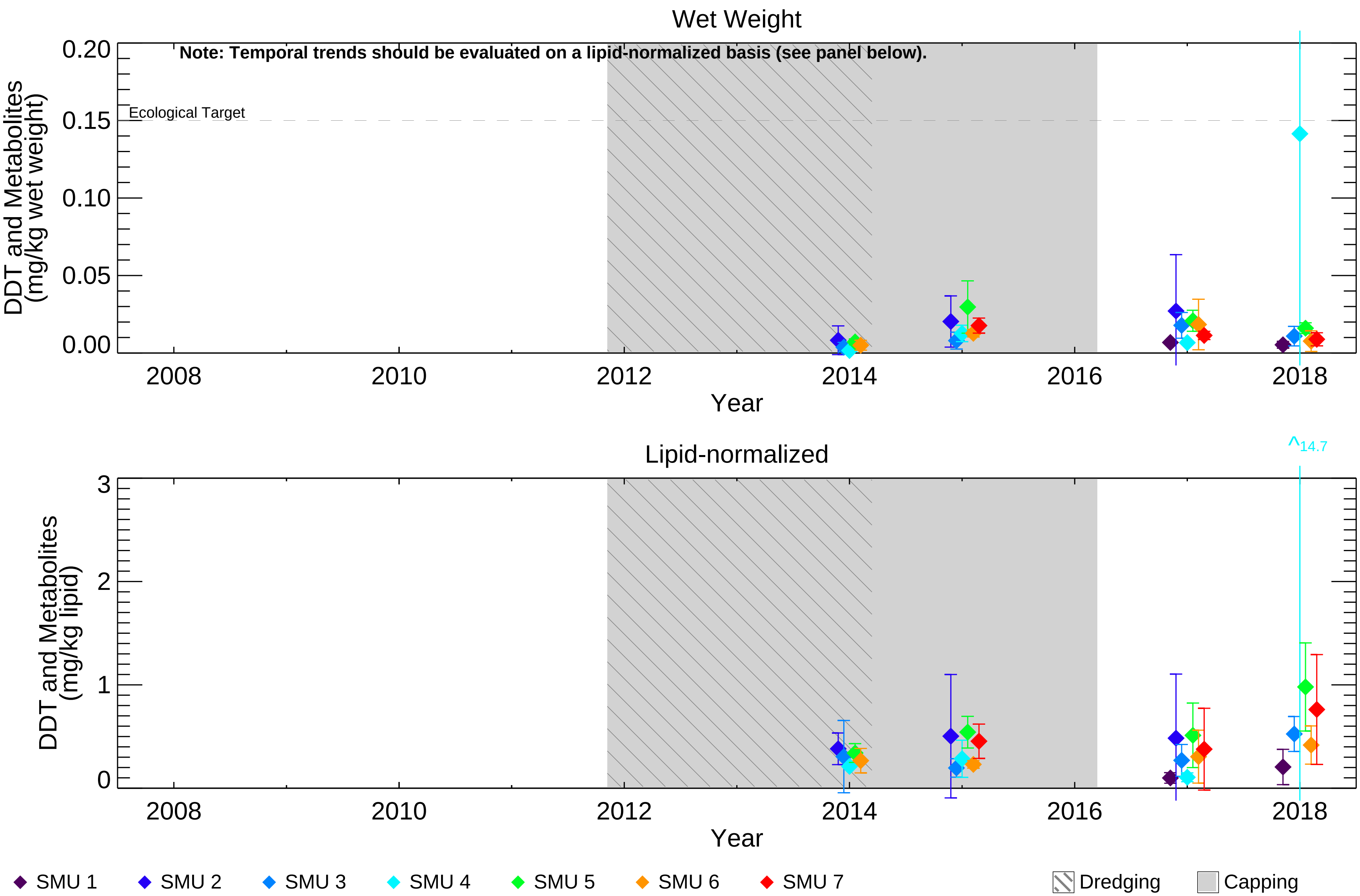


Figure 3.32

Temporal Profile of DDT and Metabolites Concentrations in Onondaga Lake Large Prey Fish: 2008 to 2018

Notes: Large prey fish = White Sucker.
Targets are not performance criteria. Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring.
Non-detects included at 1/2 RL. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE.
In-lake remediation began in late July 2012. Large prey fish sampling began in 2014.
DDT and Metabolites are not analyzed in fish tissue on an annual basis, and were not analyzed in 2016. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 12:17:54 2019

Small Prey Fish

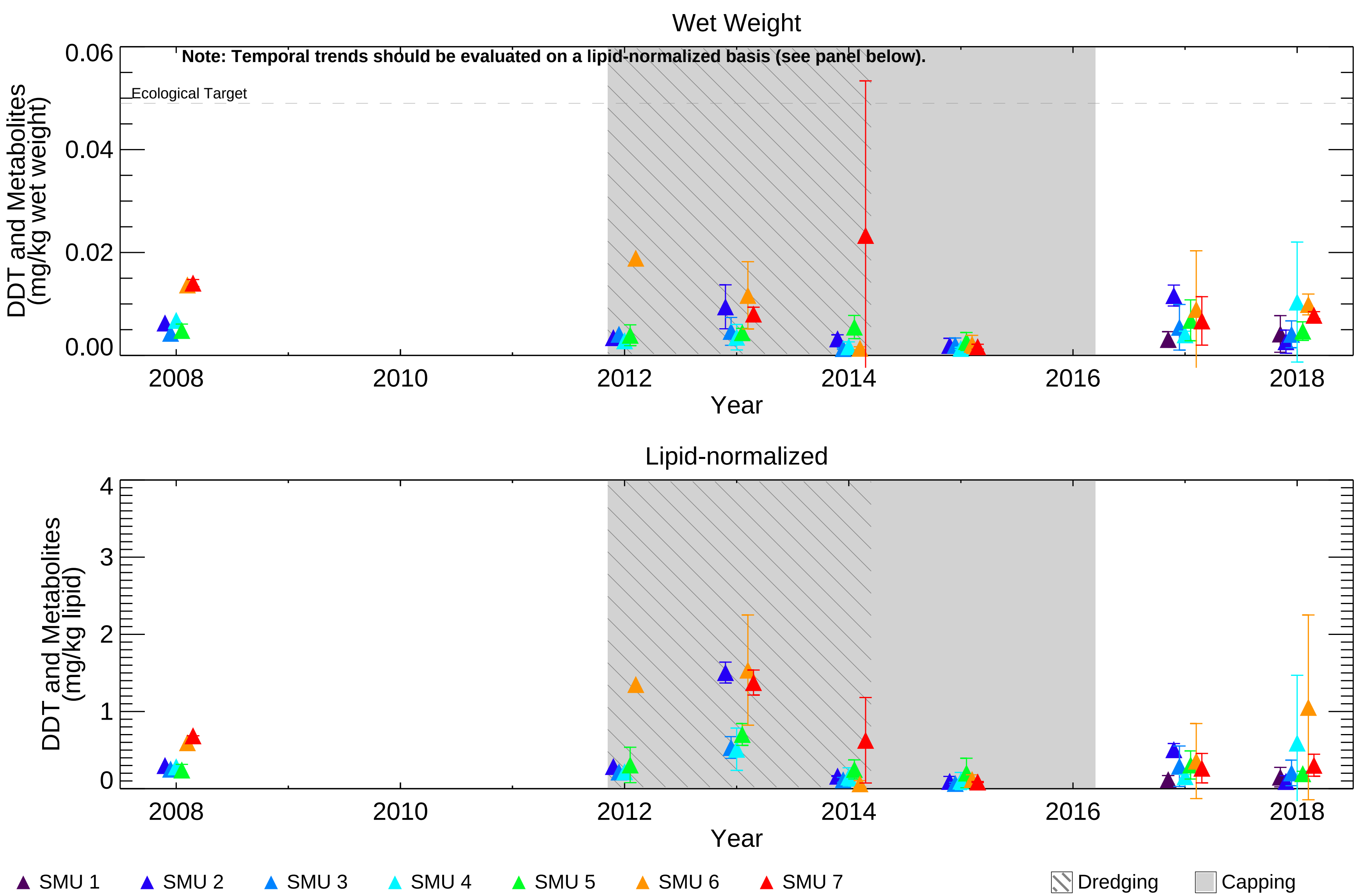
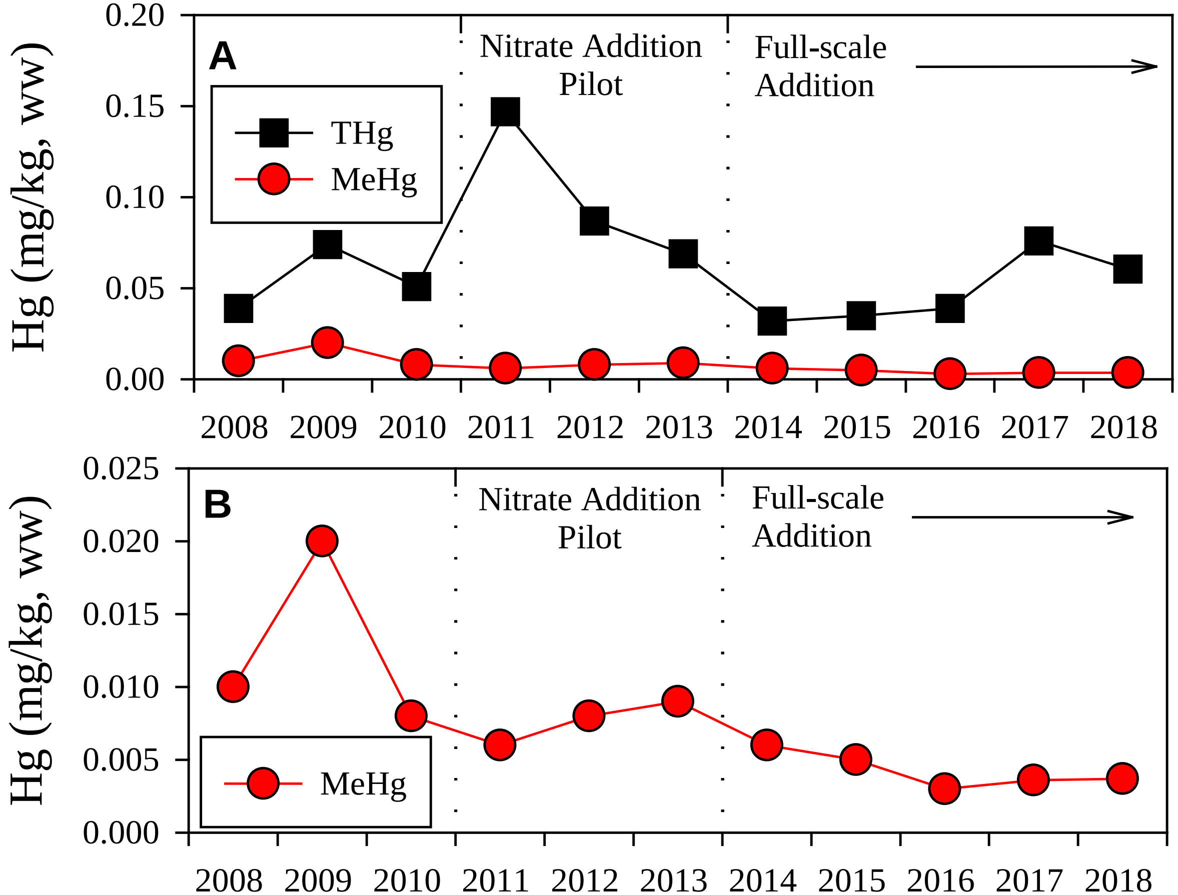


Figure 3.33

Temporal Profile of DDT and Metabolites Concentrations in Onondaga Lake Small Prey Fish: 2008 to 2018

Notes: Small prey fish = Golden Shiner, Minnow, Bluntnose Minnow, Banded Killifish, and Round Goby (Alewife excluded). Targets are not performance criteria. Data source: 2008 through 2011 Baseline Monitoring Program, 2012 through 2018 Remedial Goal Monitoring. Non-detects included at 1/2 RL. Prey fish had whole body preparation; all ages and sexes combined; mean +/- 2 SE. In 2012, in-lake remediation began in late July and fish were sampled in early August 2012. 2010 organics data are excluded from long-term trends. DDT and Metabolites are not analyzed in fish tissue on an annual basis, and were not analyzed in 2016. Preliminary draft.

SMS - \\bellingham2\bell2\Projects\Honeywell\Onondaga_Lake_OLMMS_(E60287)\Analysis\Fish\2018_OMM\IDL\temporal_preyfish_bysmus_from_2005.pro Wed May 22 12:17:51 2019



(A) total mercury and methylmercury concentrations and
(B) methylmercury concentrations presented with modified y-axis.

FIGURE 3.34

Honeywell

Onondaga Lake
Syracuse, New York

Annual Average Wet Weight Mercury Concentrations in Zooplankton (2008-2018)

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560

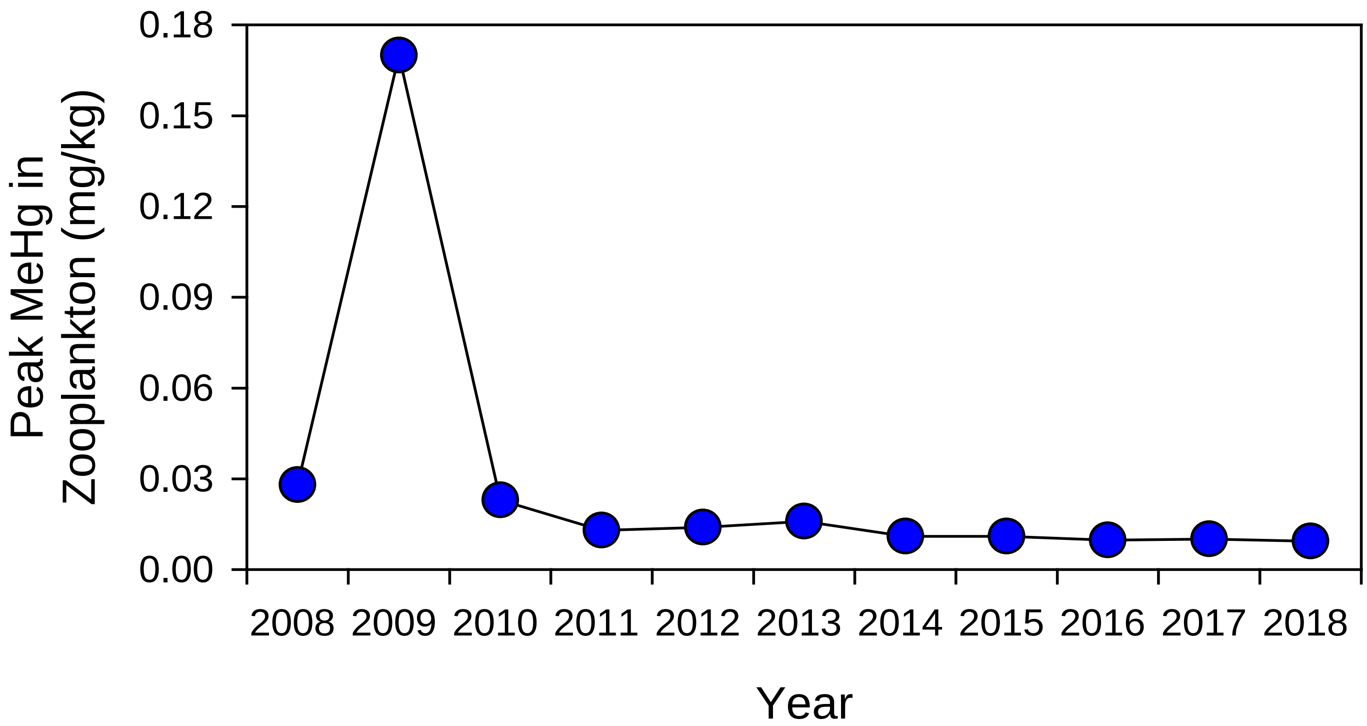


FIGURE 3.35

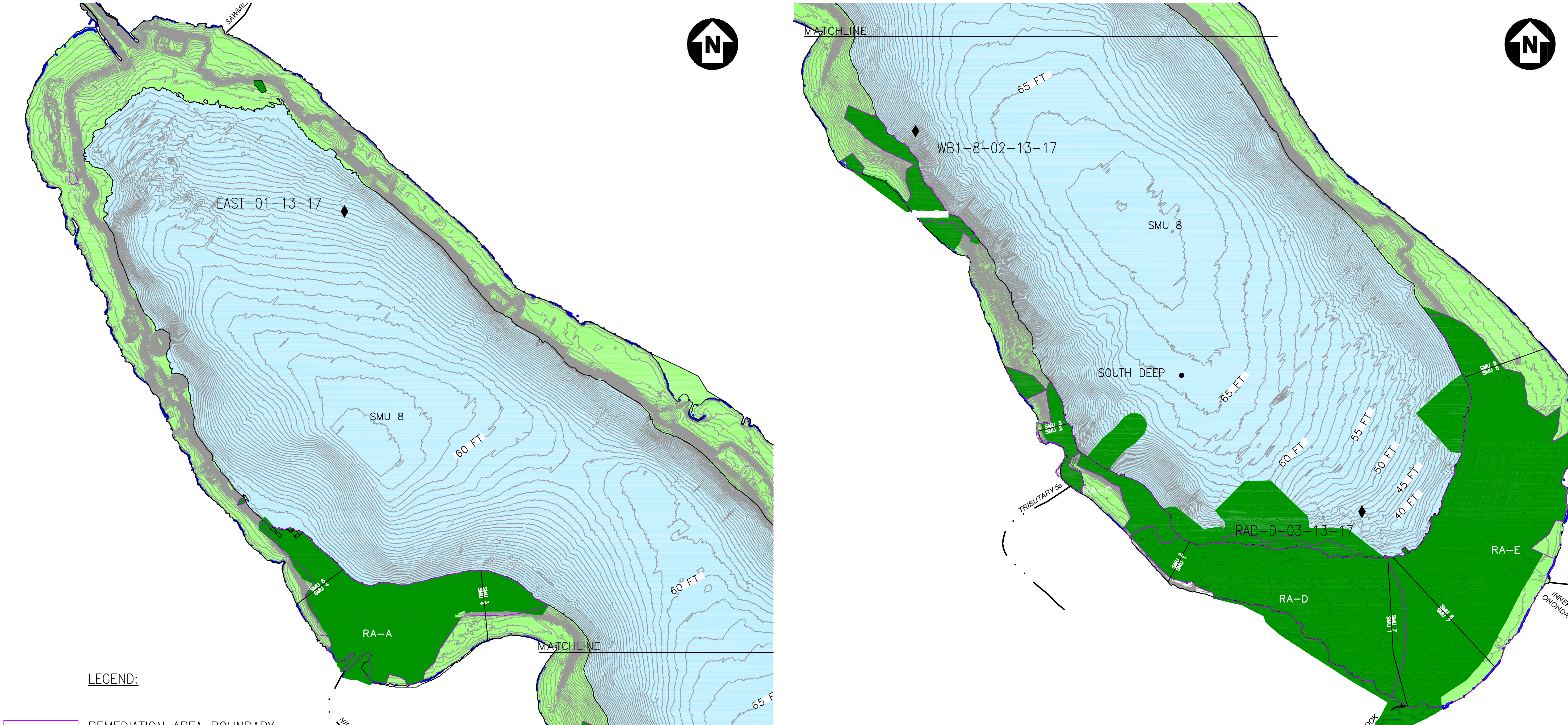
Honeywell

Onondaga Lake
Syracuse, New York

Annual Maximum Wet Weight Mercury Concentrations in Zooplankton (2008-2018)

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560



LEGEND:

- REMEDIATION AREA BOUNDARY
- SMU BOUNDARY
- CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)
- SMU 8
- LITTORAL ZONE
- ● ZOOPLANKTON SAMPLE LOCATION
- ♦ 2017 MACROINVERTEBRATE SAMPLE LOCATIONS

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT.

1500 0 1500 3000

SCALE: 1"=1500'

FIGURE 3.36

Honeywell

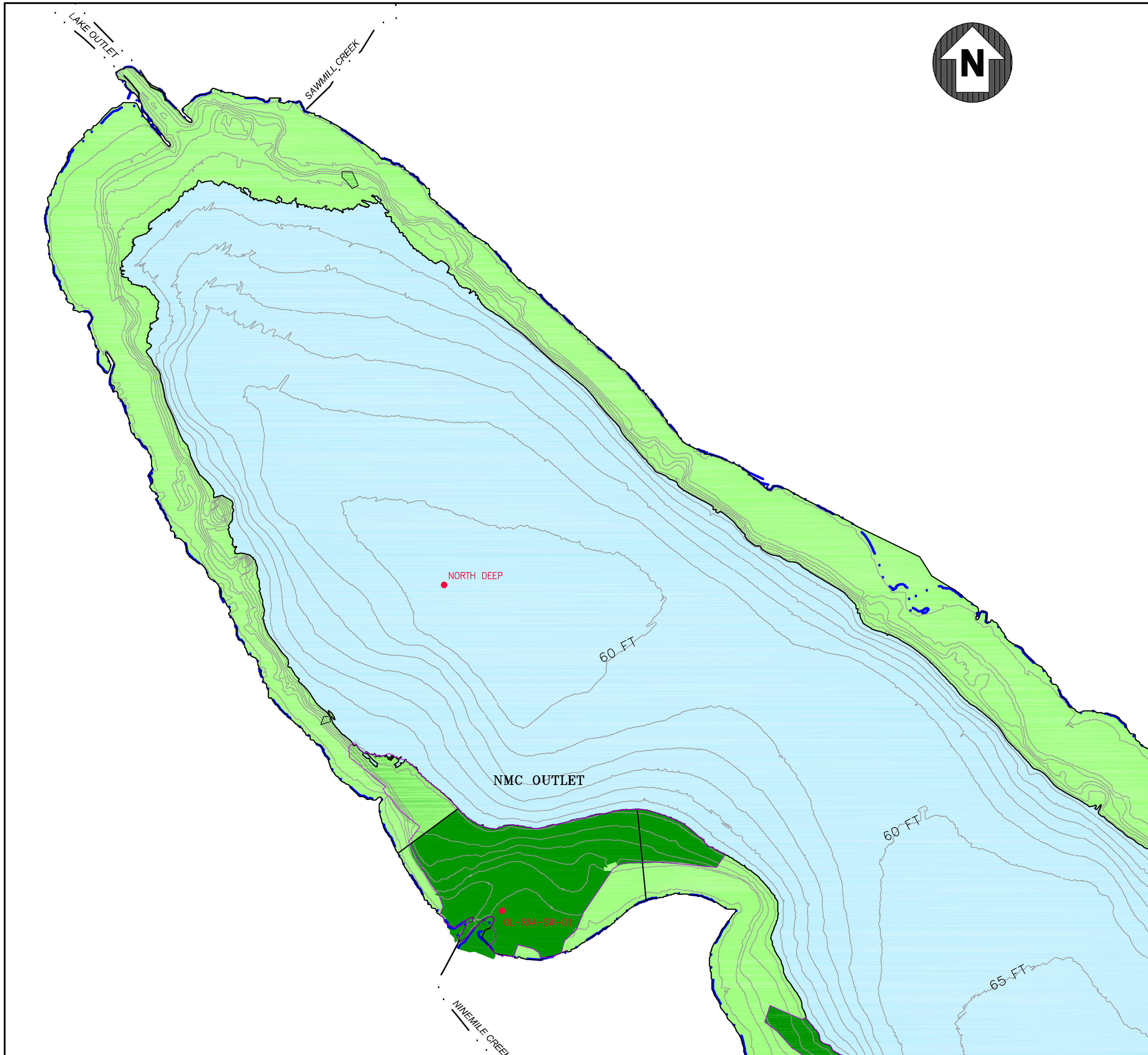
ONONDAGA LAKE
SYRACUSE, NEW YORK

ZOOPLANKTON SAMPLE LOCATION AND 2017 MACROINVERTEBRATE SAMPLE LOCATIONS IN SMU 8

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2017 ANNUAL REPORT\450704-ANNUALRPT-2017-02.DWG
PLOT DATE: 6/10/2019 11:16 AM PLOTTED BY: RUSSO, JILL



LEGEND:

- REMEDIATION AREA BOUNDARY
- SMU BOUNDARY
- CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)
- SMU 8
- LITTORAL ZONE
- SURFACE WATER SAMPLE LOCATIONS

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT (POST-REMEDIATION).
2. THE 30' WATER DEPTH CONTOUR IS THE BOUNDARY BETWEEN THE LITTORAL ZONE (SMUs 1-7) AND SMU 8.
3. SAMPLING CONDUCTED AT THE SHOWN LOCATIONS FOR BOTH PRE AND POST TURNOVER EVENTS.

1200 600 0 1200 2400

SCALE: 1"=1200'

FIGURE 4.1A

Honeywell

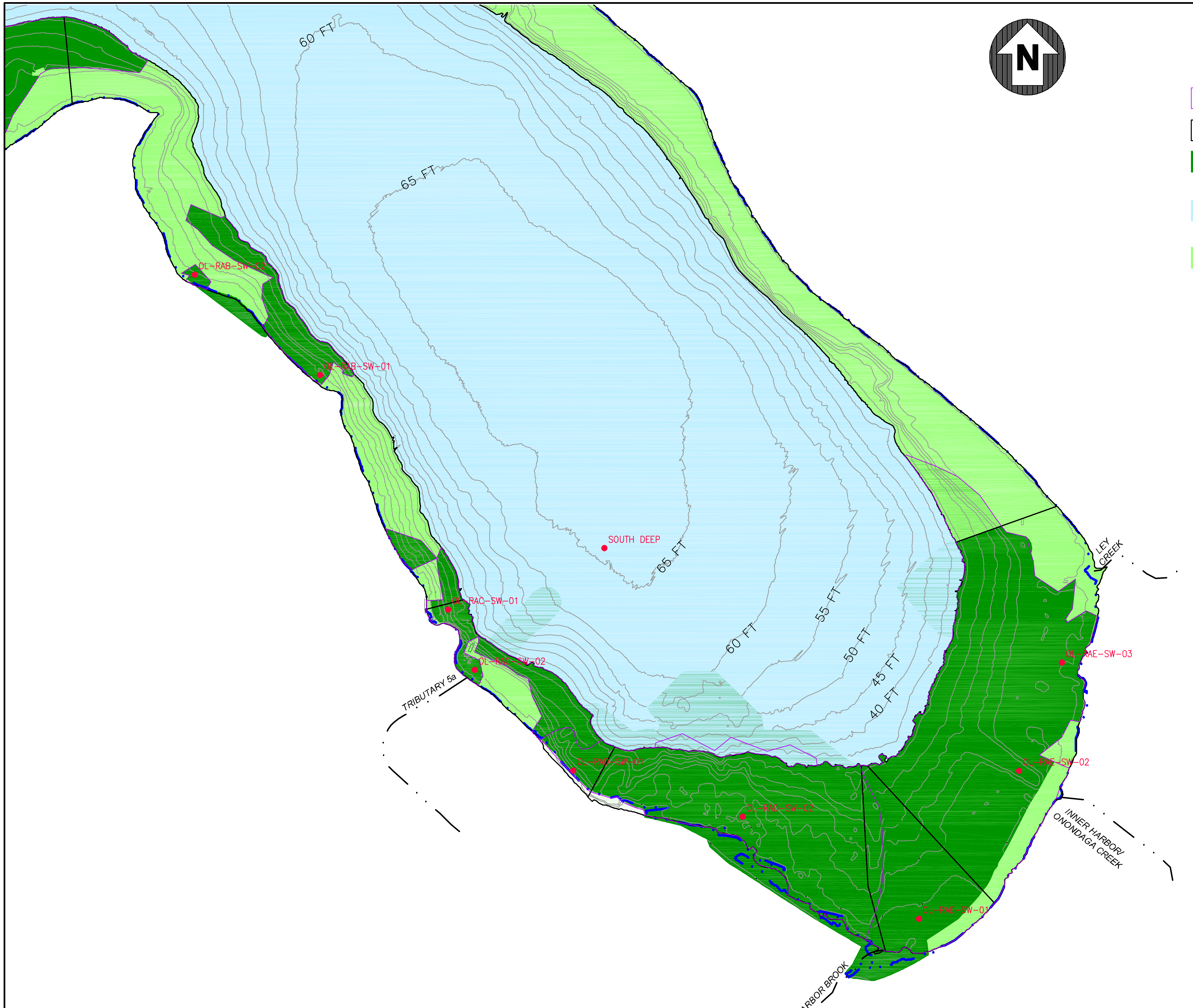
ONONDAGA LAKE
SYRACUSE, NEW YORK

SURFACE WATER COMPLIANCE SAMPLE LOCATIONS IN NORTH HALF OF ONONDAGA LAKE

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2018 ANNUAL REPORT\450704-ANNUALRPT-2018-03.DWG
PLOT DATE: 5/8/2019 9:11 AM PLOTTED BY: RUSSO, JILL



LEGEND:

- REMEDIATION AREA BOUNDARY
- SMU BOUNDARY
- CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)
- SMU 8
- LITTORAL ZONE
- SURFACE WATER SAMPLE LOCATIONS

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT (POST-REMEDIATION).
2. THE 30' WATER DEPTH CONTOUR IS THE BOUNDARY BETWEEN THE LITTORAL ZONE (SMUs 1-7) AND SMU 8.
3. SAMPLING CONDUCTED AT THE SHOWN LOCATIONS FOR BOTH PRE AND POST TURNOVER EVENTS.

1200 600 0 1200 2400

SCALE: 1"=1200'

FIGURE 4.1B

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

SURFACE WATER COMPLIANCE SAMPLE LOCATIONS IN SOUTH HALF OF ONONDAGA LAKE

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450704 2017-2018 OL PVM\10 TECHNICAL CATEGORIES\10.1 CAD\2018 ANNUAL REPORT\450704-ANNUALRPT-2018-03.DWG
PLOT DATE: 5/8/2019 9:10 AM PLOTTED BY: RUSSO, JILL

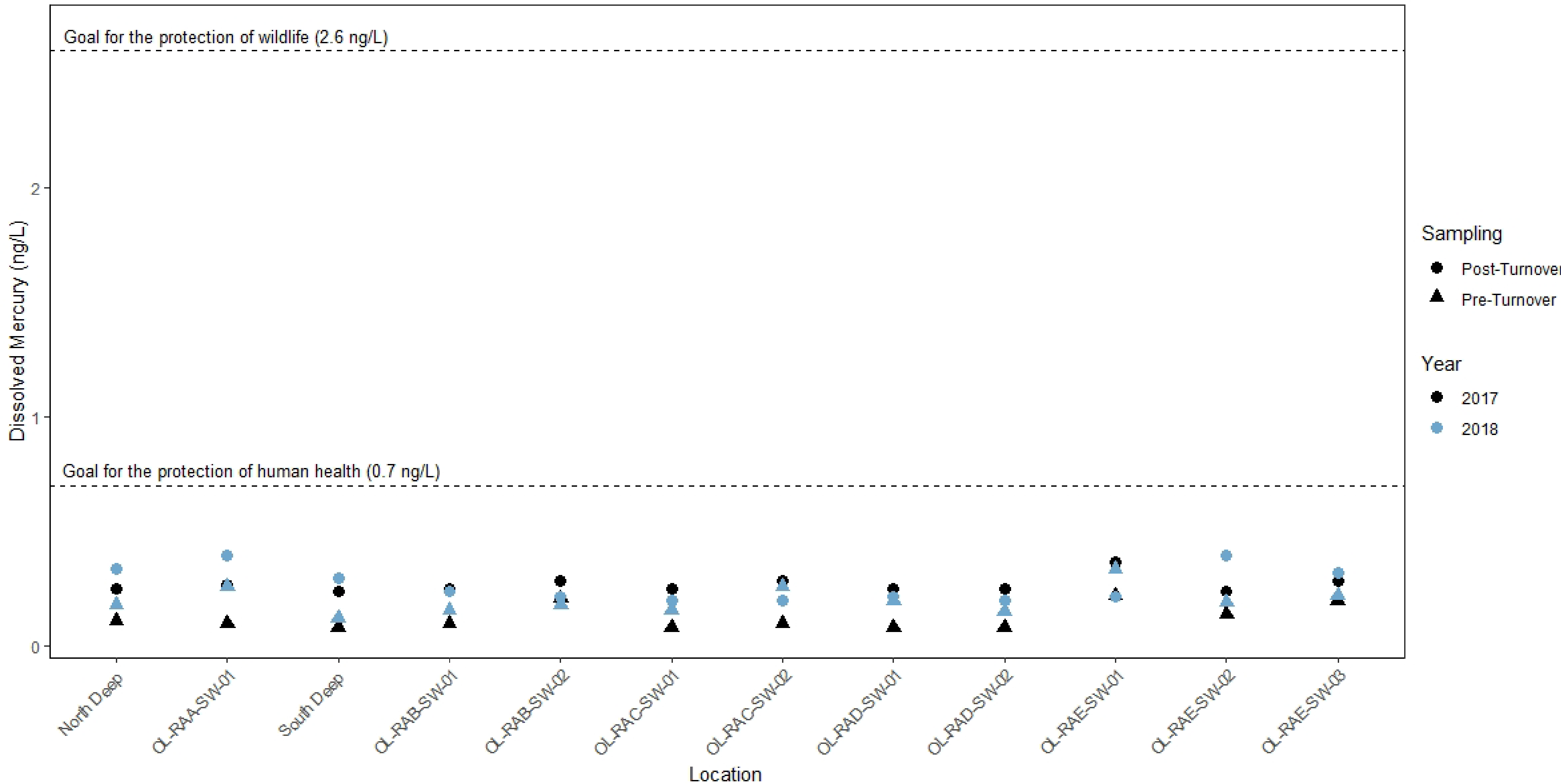


FIGURE 4.2

Honeywell

Onondaga Lake
Syracuse, New York

Onondaga Lake Dissolved Mercury Concentrations (2017-2018)

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560

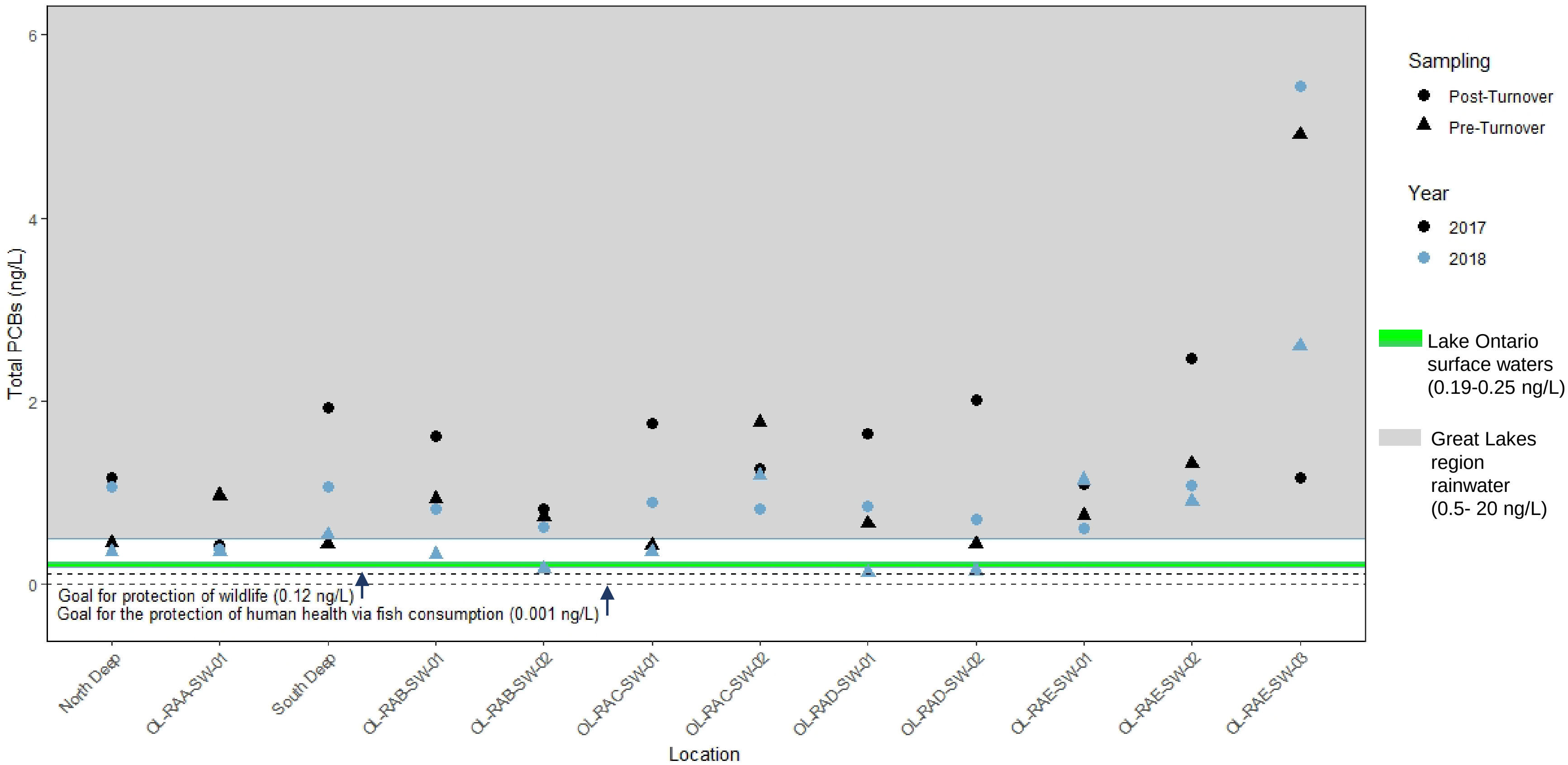


FIGURE 4.3

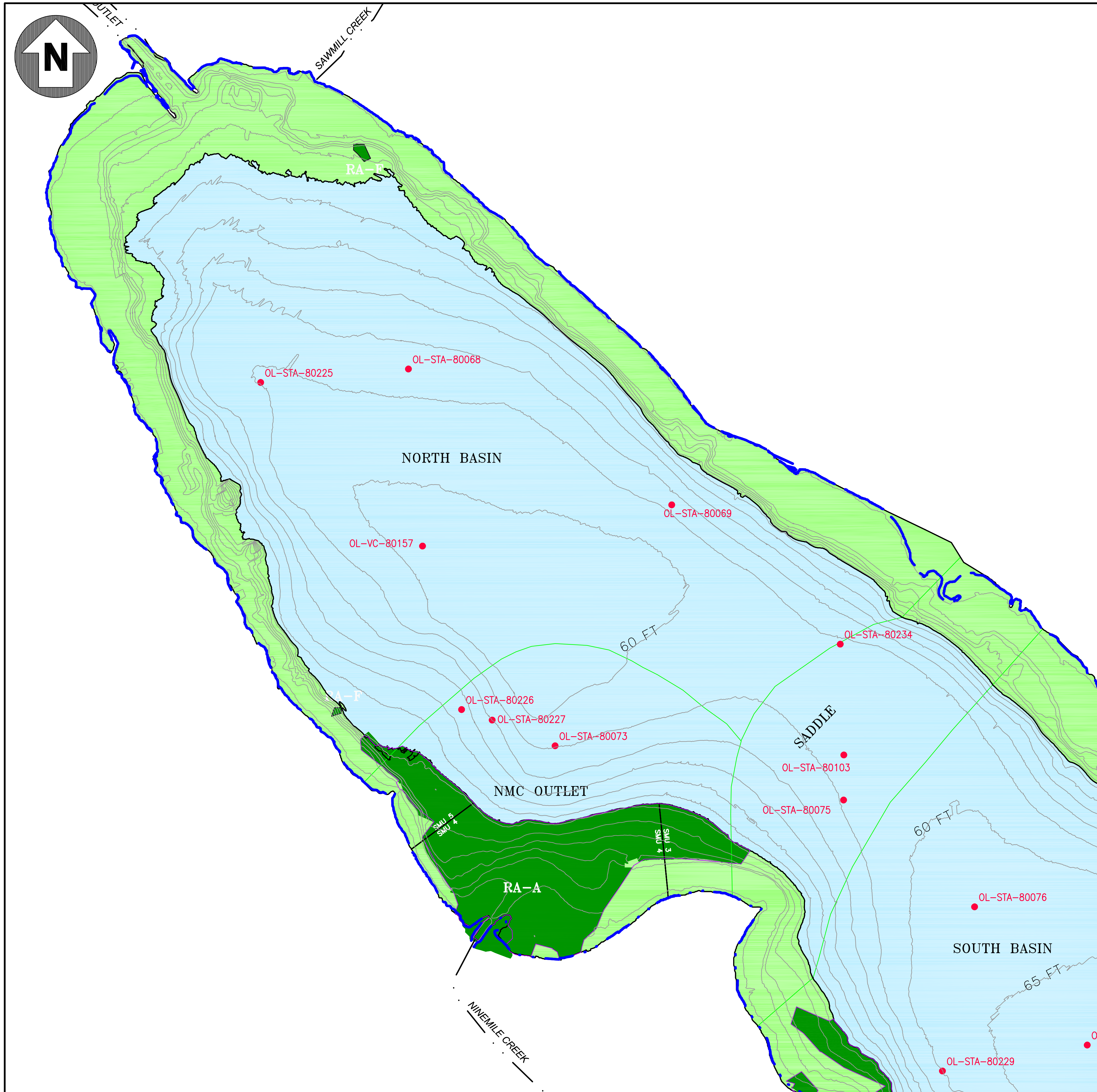
Honeywell

Onondaga Lake
Syracuse, New York

Onondaga Lake Total PCB Concentrations (2017-2018)

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560



LEGEND:

REMEDIATION AREA BOUNDARY

SMU BOUNDARY

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

SMU 8

LITTORAL ZONE

SAMPLE LOCATION (2017)

SEDIMENT TRAP SAMPLE LOCATION

DEMARCATION FOR BSQV SUBAREAS (DELINEATION IS APPROXIMATE AND MAY BE MODIFIED BASED ON DEVELOPMENT OF FINAL THIESSEN POLYGONS FOR BSQV EVALUATION)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. THE 30' WATER DEPTH CONTOUR IS THE BOUNDARY BETWEEN THE LITTORAL ZONE (SMUs 1-7) AND SMU 8.

1200 600 0 1200 2400

SCALE: 1"=1200'

FIGURE 5.1A

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

SMU 8 ROUTINE SEDIMENT SAMPLE LOCATIONS IN NORTH HALF OF ONONDAGA LAKE

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2017\450102-MNR-2017-03A.DWG
PLOT DATE: 6/11/2019 3:00 PM PLOTTED BY: RUSSO, JILL

LEGEND:

REMEDIATION AREA BOUNDARY

SMU BOUNDARY

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

SMU 8

LITTORAL ZONE

SAMPLE LOCATION (2017)

SEDIMENT TRAP SAMPLE LOCATION

DEMARCATION FOR BSQV SUBAREAS (DELINEATION IS APPROXIMATE AND MAY BE MODIFIED BASED ON DEVELOPMENT OF FINAL THIESSEN POLYGONS FOR BSQV EVALUATION)

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT. (POST-REMEDY CONTOURS SHOWN)
2. THE 30' WATER DEPTH CONTOUR IS THE BOUNDARY BETWEEN THE LITTORAL ZONE (SMUs 1-7) AND SMU 8.

1200 600 0 1200 2400

SCALE: 1"=1200'

FIGURE 5.1B

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

SMU 8 ROUTINE SEDIMENT SAMPLE LOCATIONS IN SOUTH HALF OF ONONDAGA LAKE

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315-451-9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2017\450102-MNR-2017-03A.DWG
PLOT DATE: 6/11/2019 3:03 PM PLOTTED BY: RUSSO, JILL

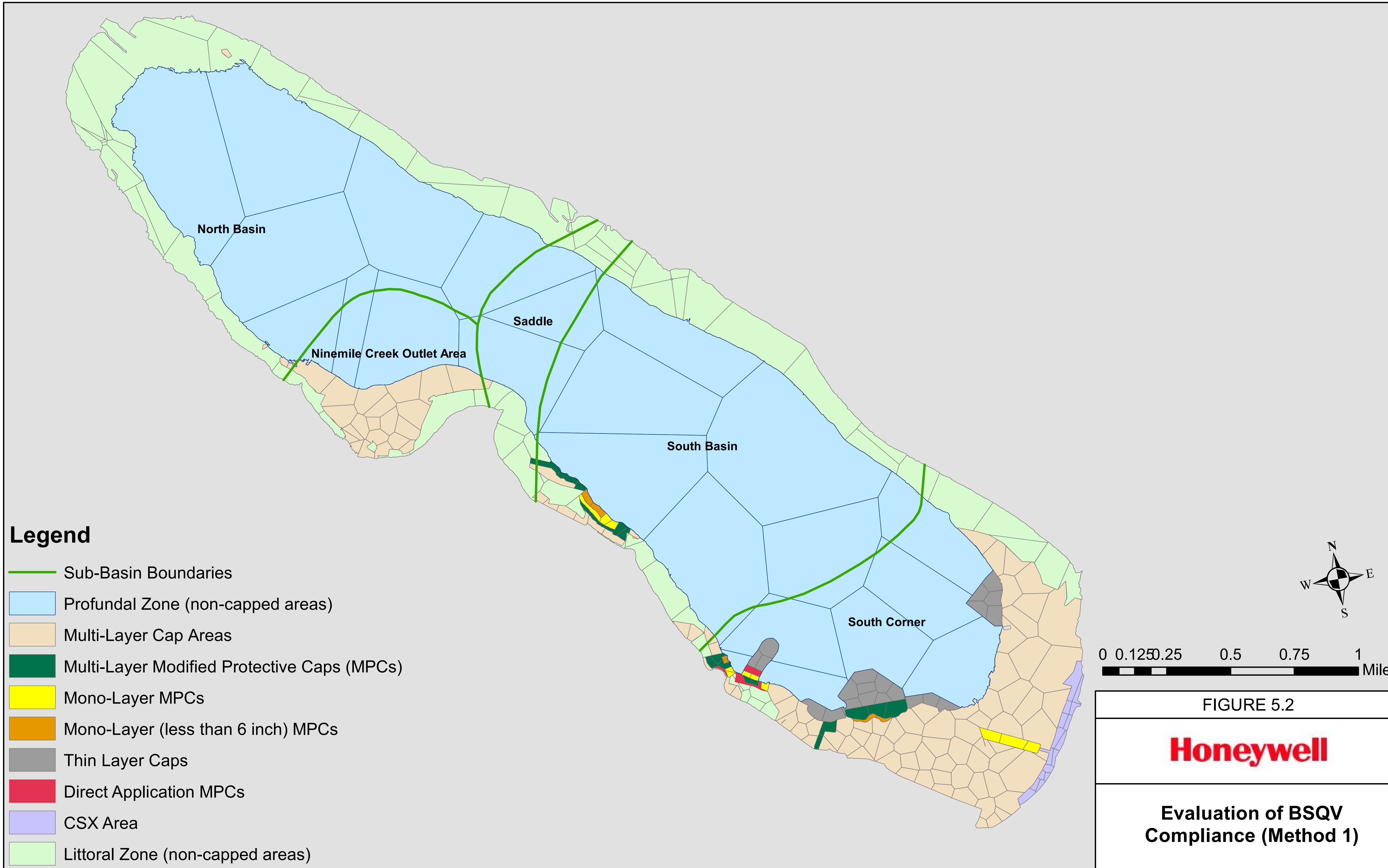


FIGURE 5.2

Honeywell

Evaluation of BSQV Compliance (Method 1)

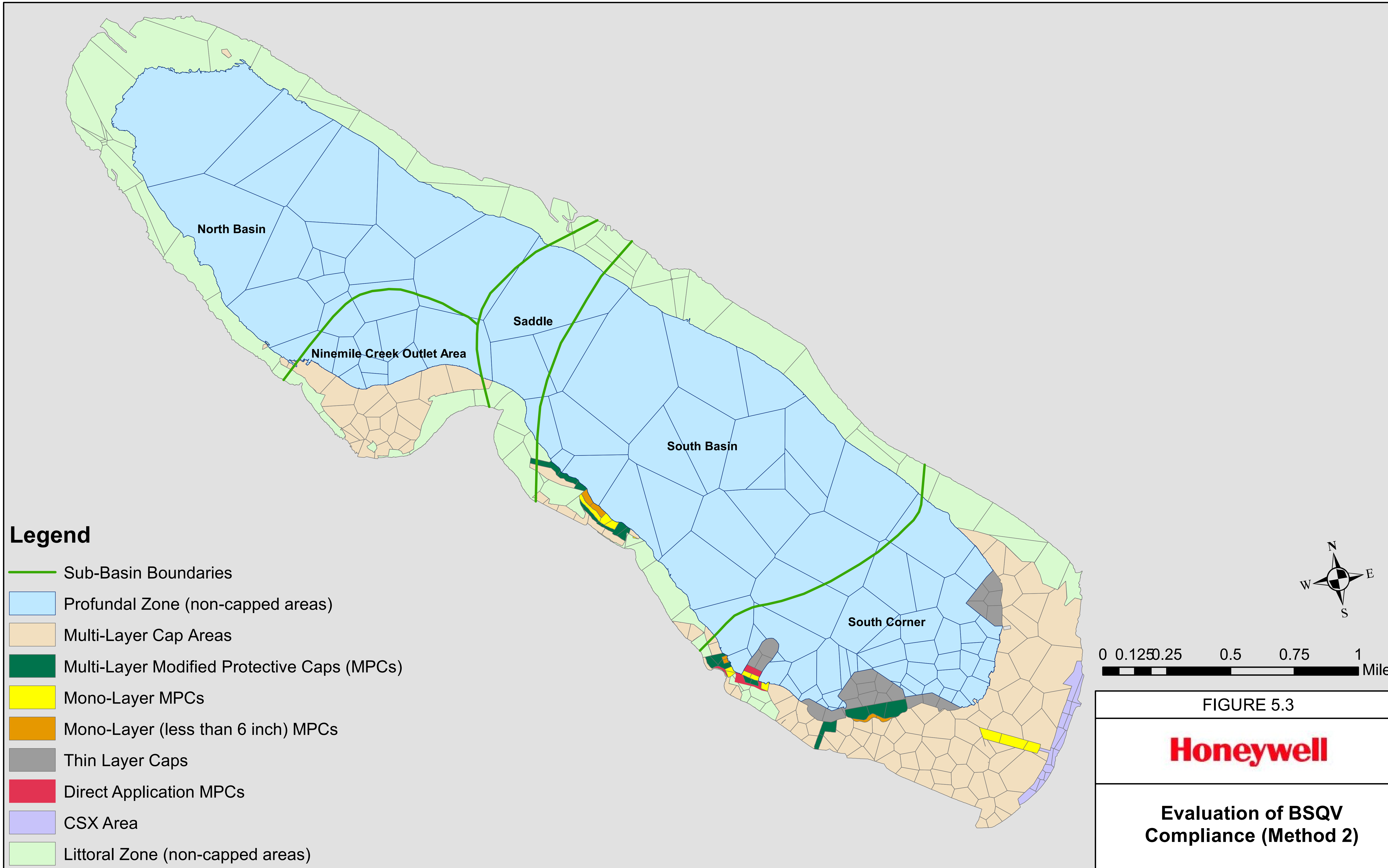
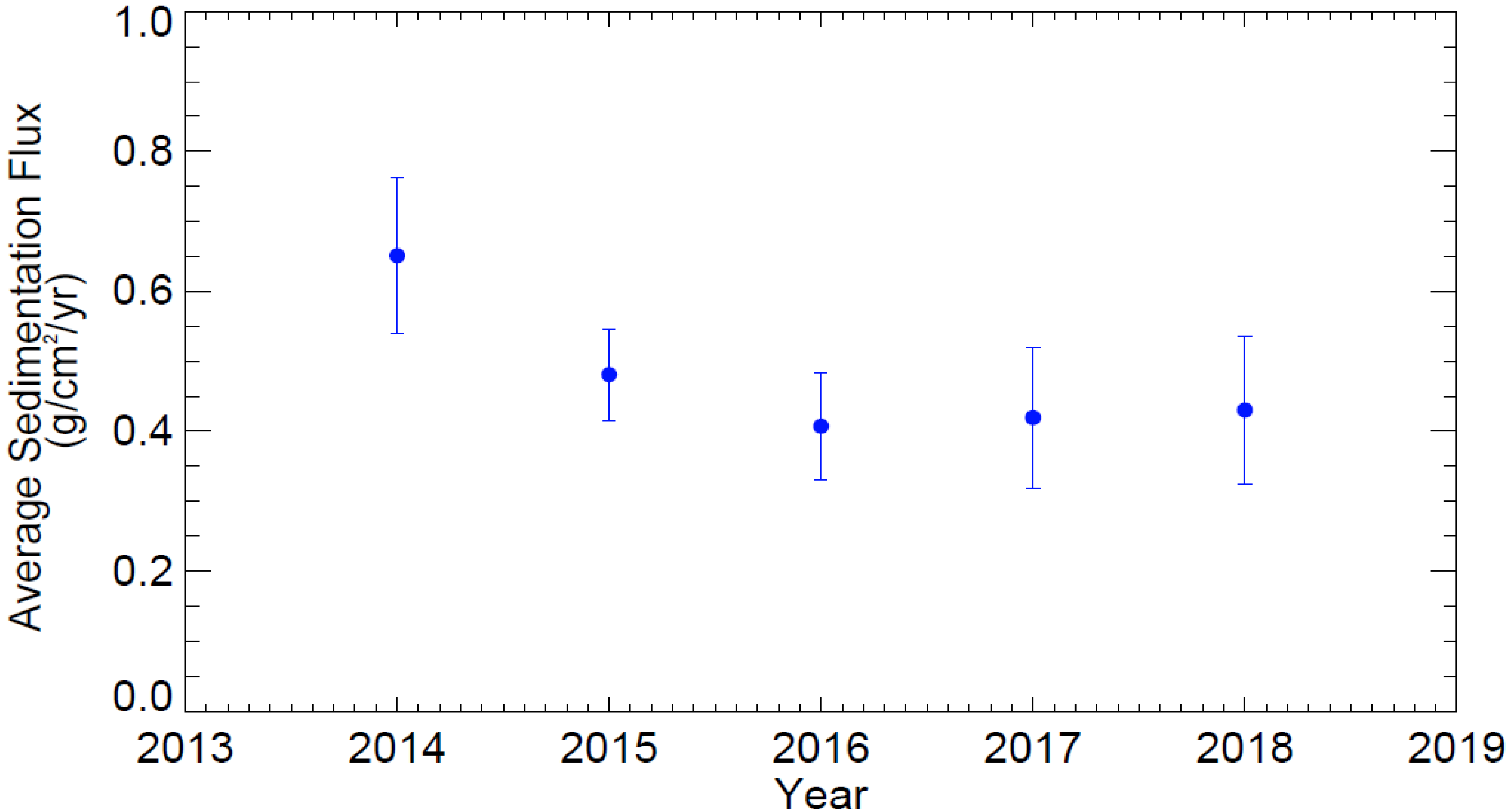


FIGURE 5.3

Honeywell

Evaluation of BSQV Compliance (Method 2)



Note: Plots show the average +/- 2 standard error (SE) of the mean, which is one way of representing the variability in weekly values obtained for the year noted.

FIGURE 5.4

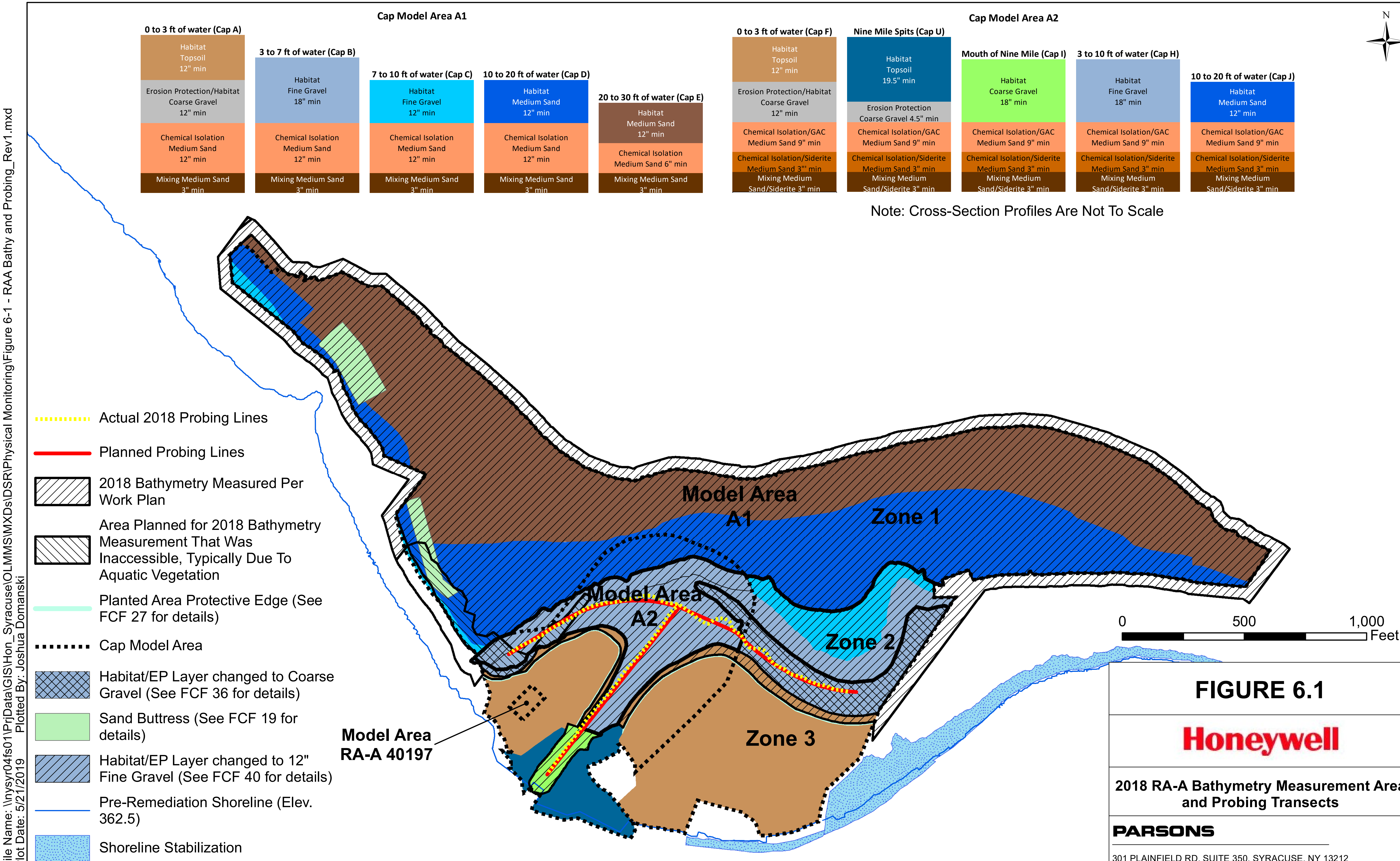
Honeywell

Onondaga Lake
Syracuse, New York

Onondaga Lake Sediment Trap Flux (2014-2018)

PARSONS

301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, NY 13212 PHONE: (315) 451-9560



Cap Model Area A1
0 to 3 ft of water (Cap A)
Habitat Topsoil 12" min
Erosion Protection/Habitat Coarse Gravel 12" min
Chemical Isolation Medium Sand 12" min
Mixing Medium Sand 3" min
3 to 7 ft of water (Cap B)
Habitat Fine Gravel 18" min
Chemical Isolation Medium Sand 12" min
Mixing Medium Sand 3" min
7 to 10 ft of water (Cap C)
Habitat Fine Gravel 12" min
Chemical Isolation Medium Sand 12" min
Mixing Medium Sand 3" min
10 to 20 ft of water (Cap D)
Habitat Medium Sand 12" min
Chemical Isolation Medium Sand 12" min
Mixing Medium Sand 3" min
20 to 30 ft of water (Cap E)
Habitat Medium Sand 12" min
Chemical Isolation Medium Sand 6" min
Mixing Medium Sand 3" min
Cap Model Area A2
0 to 3 ft of water (Cap F)
Habitat Topsoil 12" min
Erosion Protection/Habitat Coarse Gravel 12" min
Chemical Isolation/GAC Medium Sand 9" min
Chemical Isolation/Siderite Medium Sand 3" min
Mixing Medium Sand/Siderite 3" min
Nine Mile Spits (Cap U)
Habitat Topsoil 19.5" min
Erosion Protection Coarse Gravel 4.5" min
Chemical Isolation/GAC Medium Sand 9" min
Chemical Isolation/Siderite Medium Sand 3" min
Mixing Medium Sand/Siderite 3" min
Mouth of Nine Mile (Cap I)
Habitat Coarse Gravel 18" min
Chemical Isolation/GAC Medium Sand 9" min
Chemical Isolation/Siderite Medium Sand 3" min
Mixing Medium Sand/Siderite 3" min
3 to 10 ft of water (Cap H)
Habitat Fine Gravel 18" min
Chemical Isolation/GAC Medium Sand 9" min
Chemical Isolation/Siderite Medium Sand 3" min
Mixing Medium Sand/Siderite 3" min
10 to 20 ft of water (Cap J)
Habitat Medium Sand 12" min
Chemical Isolation/GAC Medium Sand 9" min
Chemical Isolation/Siderite Medium Sand 3" min
Mixing Medium Sand/Siderite 3" min
Note: Cross-Section Profiles Are Not To Scale
N
Model Area A1
Zone 1
Model Area A2
Zone 2
Zone 3
Model Area RA-A 40197
0
500
1,000
Feet
Actual 2018 Probing Lines
Planned Probing Lines
2018 Bathymetry Measured Per Work Plan
Area Planned for 2018 Bathymetry Measurement That Was Inaccessible, Typically Due To Aquatic Vegetation
Planted Area Protective Edge (See FCF 27 for details)
Cap Model Area
Habitat/EP Layer changed to Coarse Gravel (See FCF 36 for details)
Sand Buttress (See FCF 19 for details)
Habitat/EP Layer changed to 12" Fine Gravel (See FCF 40 for details)
Pre-Remediation Shoreline (Elev. 362.5)
Shoreline Stabilization
FIGURE 6.1
Honeywell
2018 RA-A Bathymetry Measurement Area and Probing Transects
PARSONS
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212
File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Physical Monitoring\Figure 6-1 - RAA Bathy and Probing_Rev1.mxd
Plot Date: 5/21/2019 Plotted By: Joshua Domanski

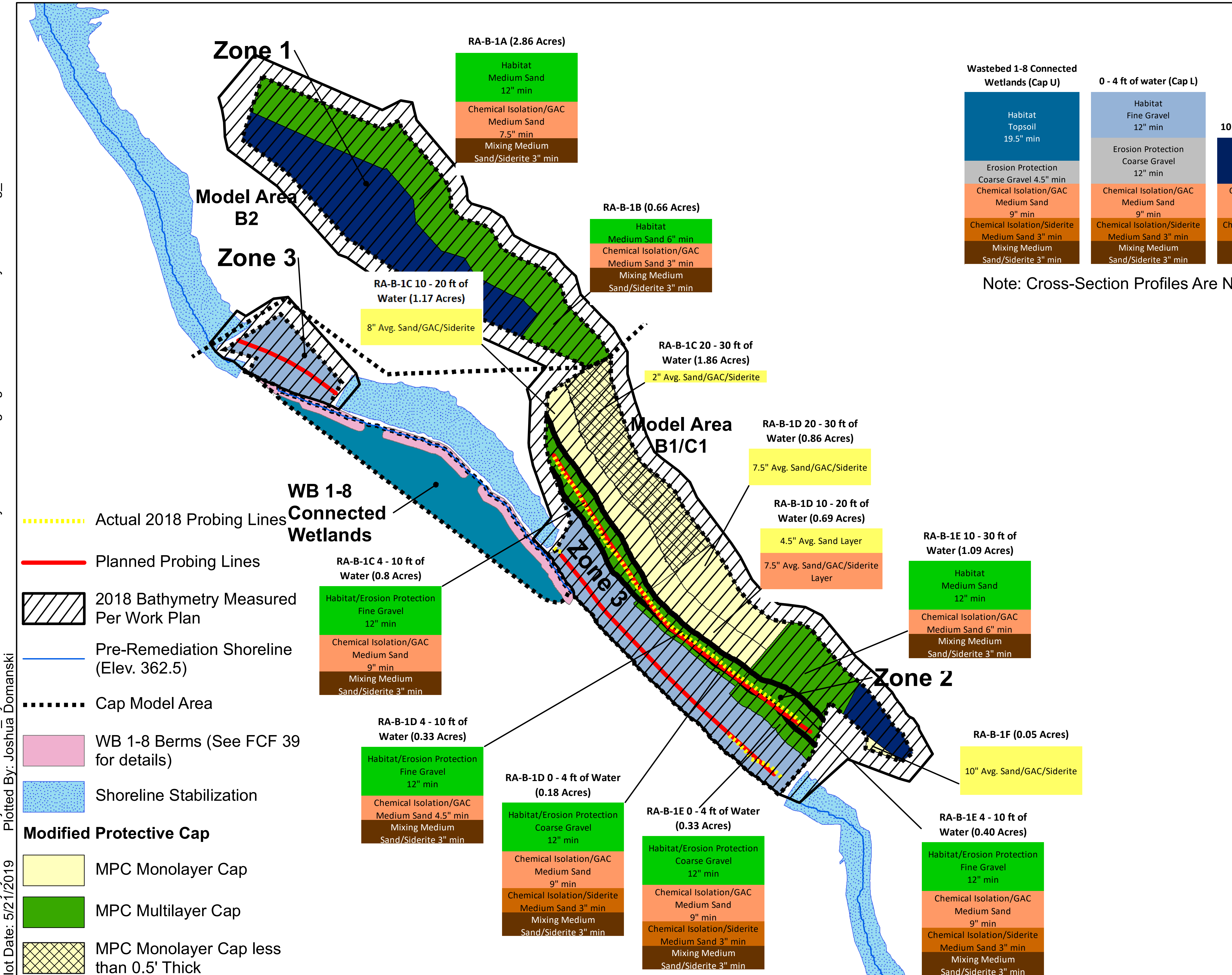


FIGURE 6.2

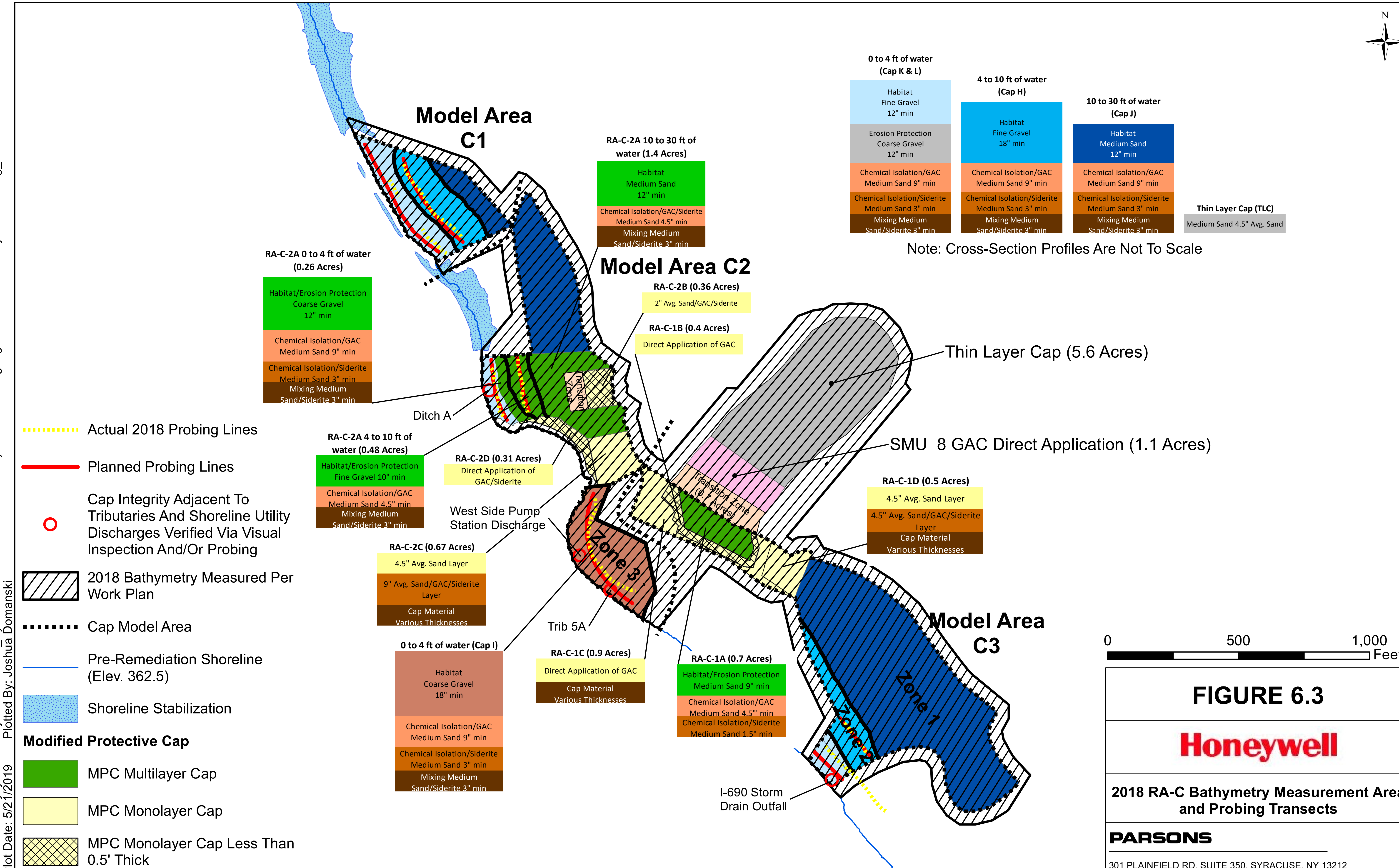
Honeywell

2018 RA-B Bathymetry Measurement Area and Probing Transects

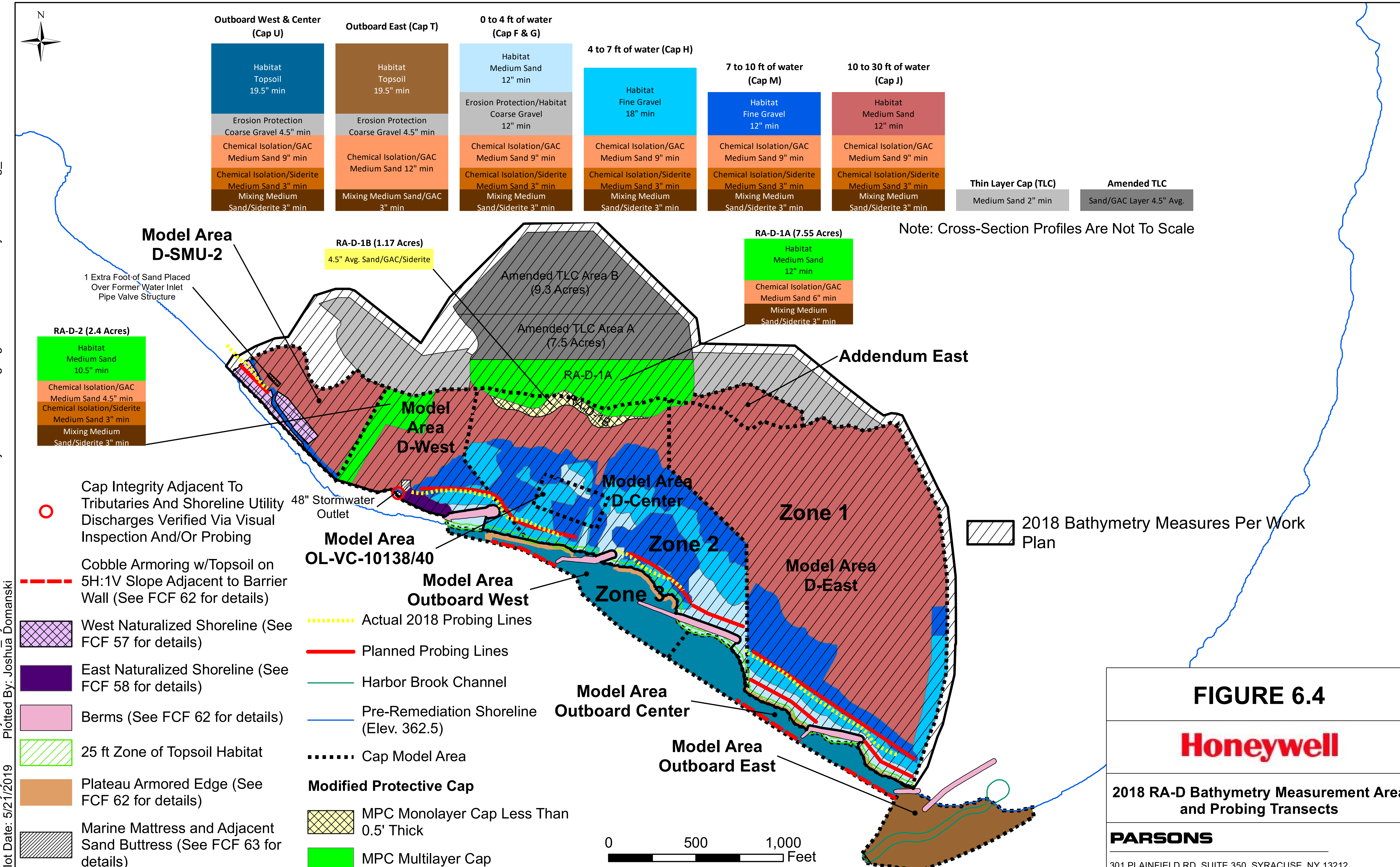
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Physical Monitoring\Figure 6-2 - RAB Bathy and Probing_Rev1.mxd
Plot Date: 5/21/2019 Plotted By: Joshua Domanski



File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Physical Monitoring\Figure 6-3 - RAC Bathy and Probing_Rev1.mxd
Plotted By: Joshua Domanski
Plot Date: 5/21/2019



File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Physical Monitoring\Figure 6-4 - RAD Bathy and Probing_Rev1.mxd
Plot Date: 5/21/2019 Plotted By: Joshua Domanski

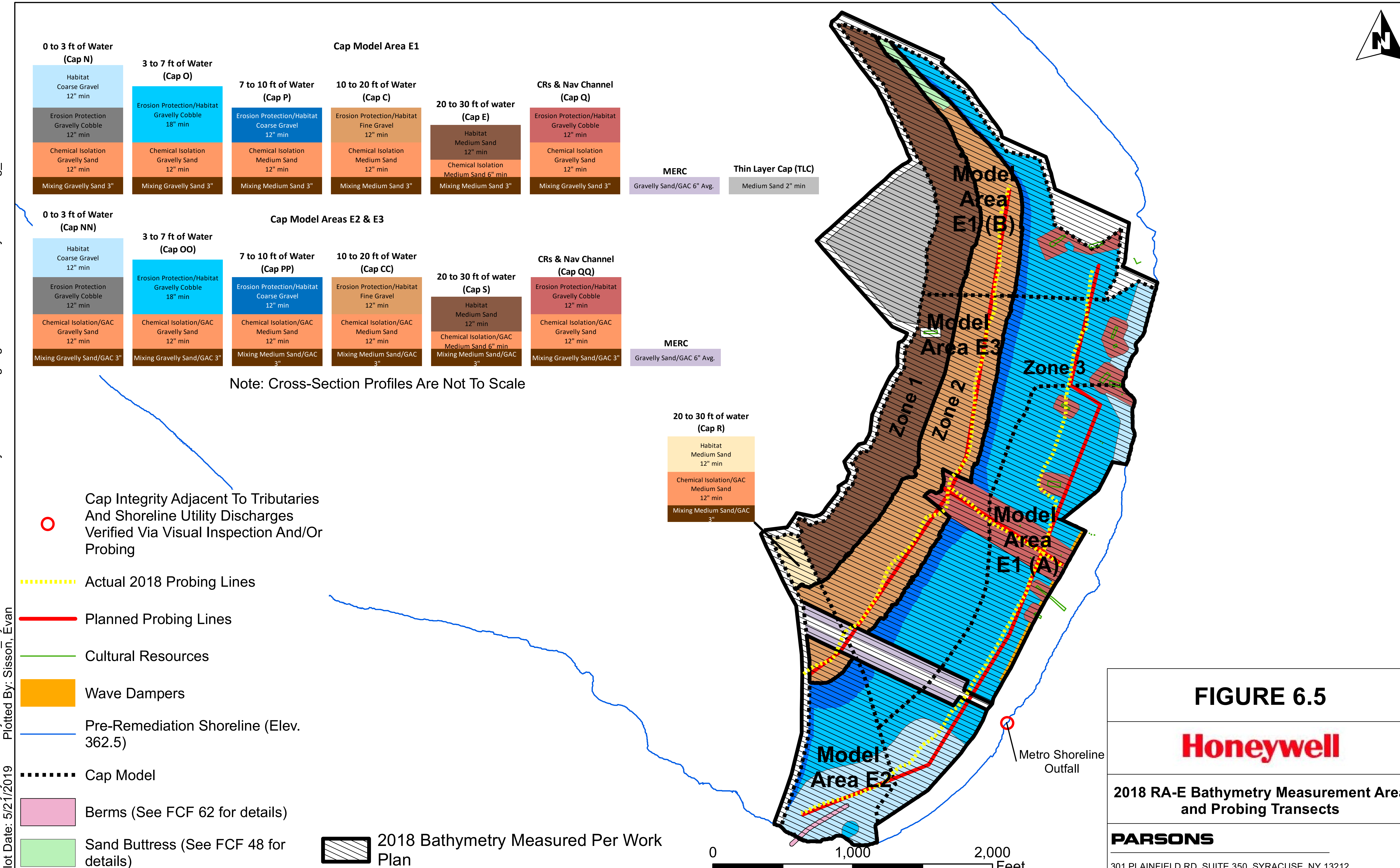


FIGURE 6.5

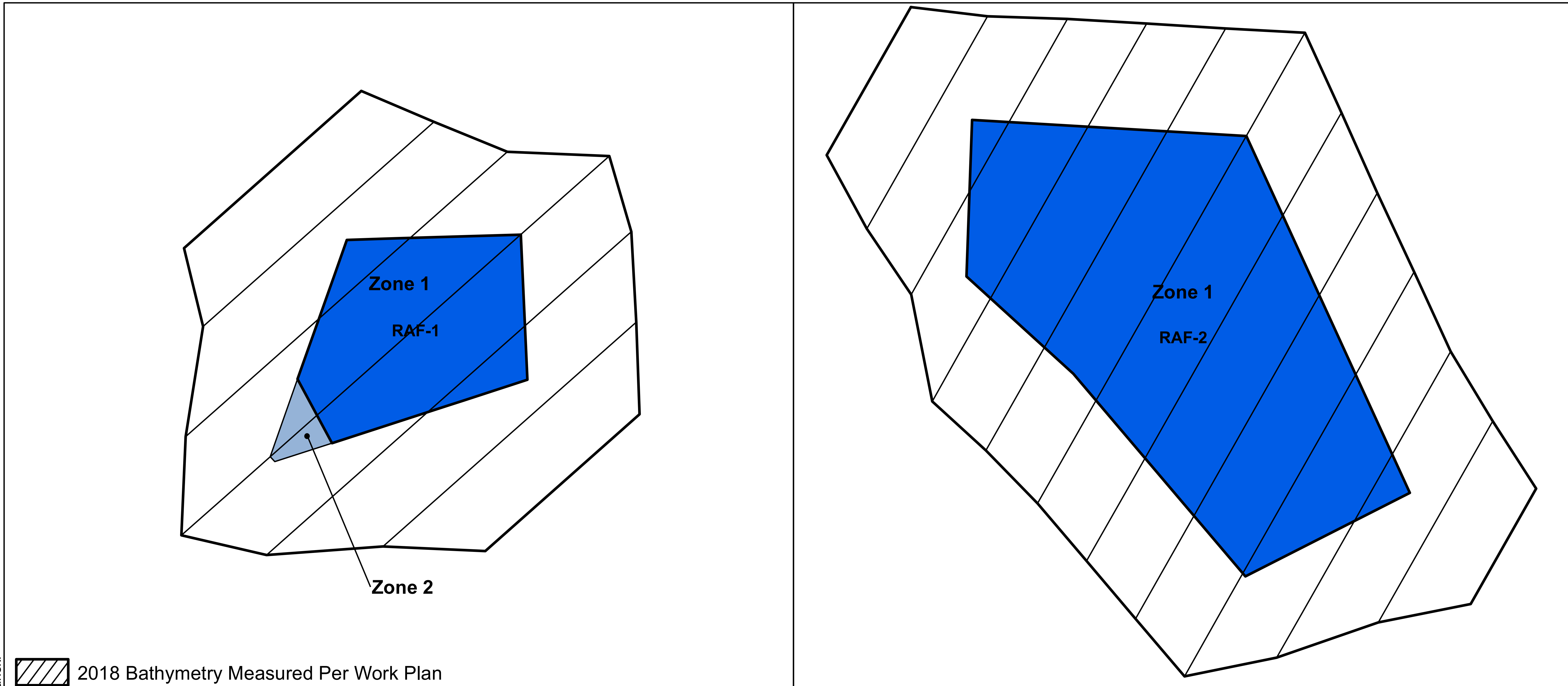
Honeywell

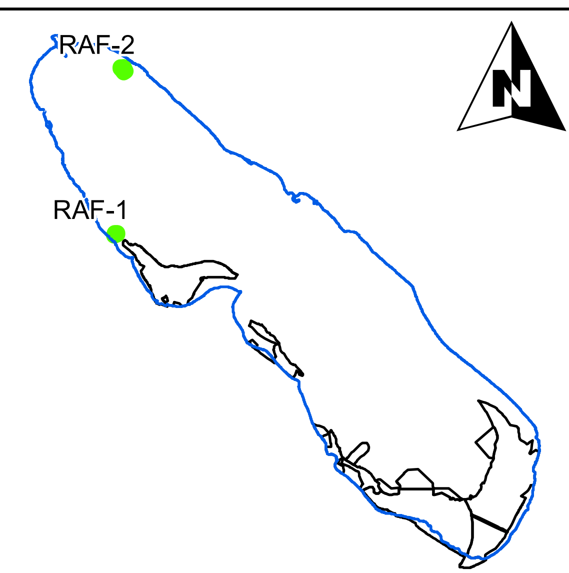
2018 RA-E Bathymetry Measurement Area and Probing Transects

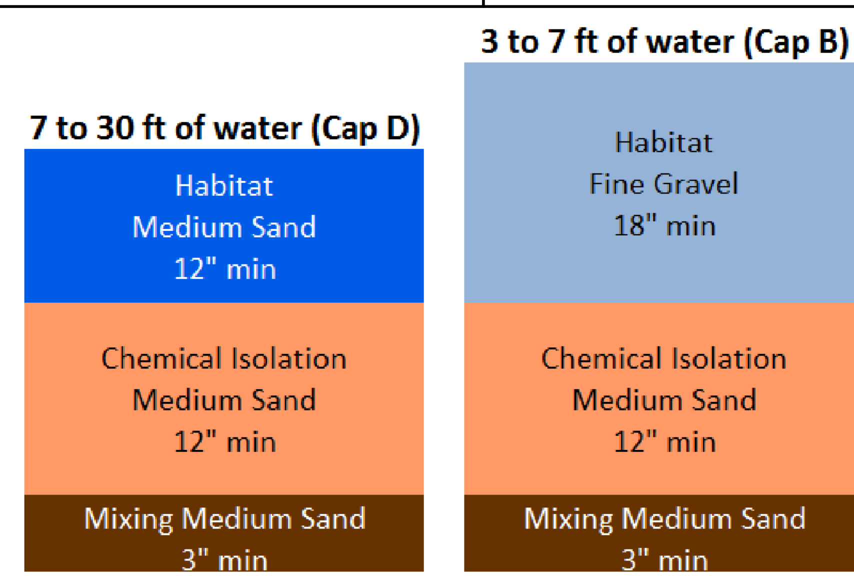
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Physical Monitoring\Figure 6-5 - RAE Bathy and Probing_Rev1.mxd
Plot Date: 5/21/2019 Plotted By: Sisson, Evan







Note: Cross-Section Profiles Are Not To Scale

0 50 100 Feet

FIGURE 6.6

Honeywell

2018 RA-F Bathymetry Measurement Area

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Physical Monitoring\Figure 6-6 - RAF Bathy and Probing_Rev1.mxd
Plot Date: 4/18/2019 Plotted By: Joshua Domanski

Note:
The 2017 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

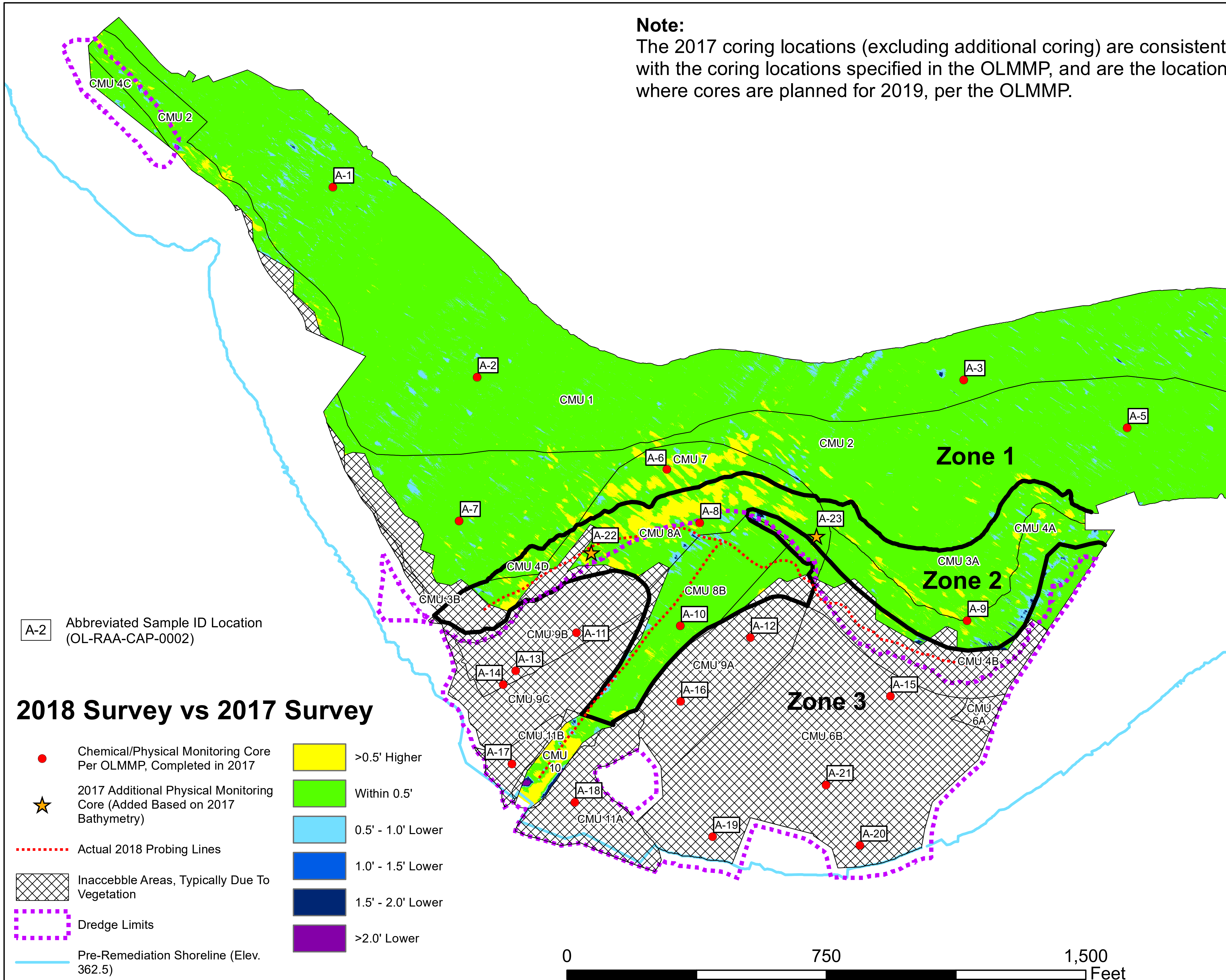


Figure 6.7

Honeywell

RA-A 2018 vs 2017 Bathymetric Survey

PARSONS
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Joshua Domanski
Plot Date: 5/8/2019

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAA OMM Survey 2017 v 2018_Rev1.mxd

Assessment Area Summary and 2019 Recommendations

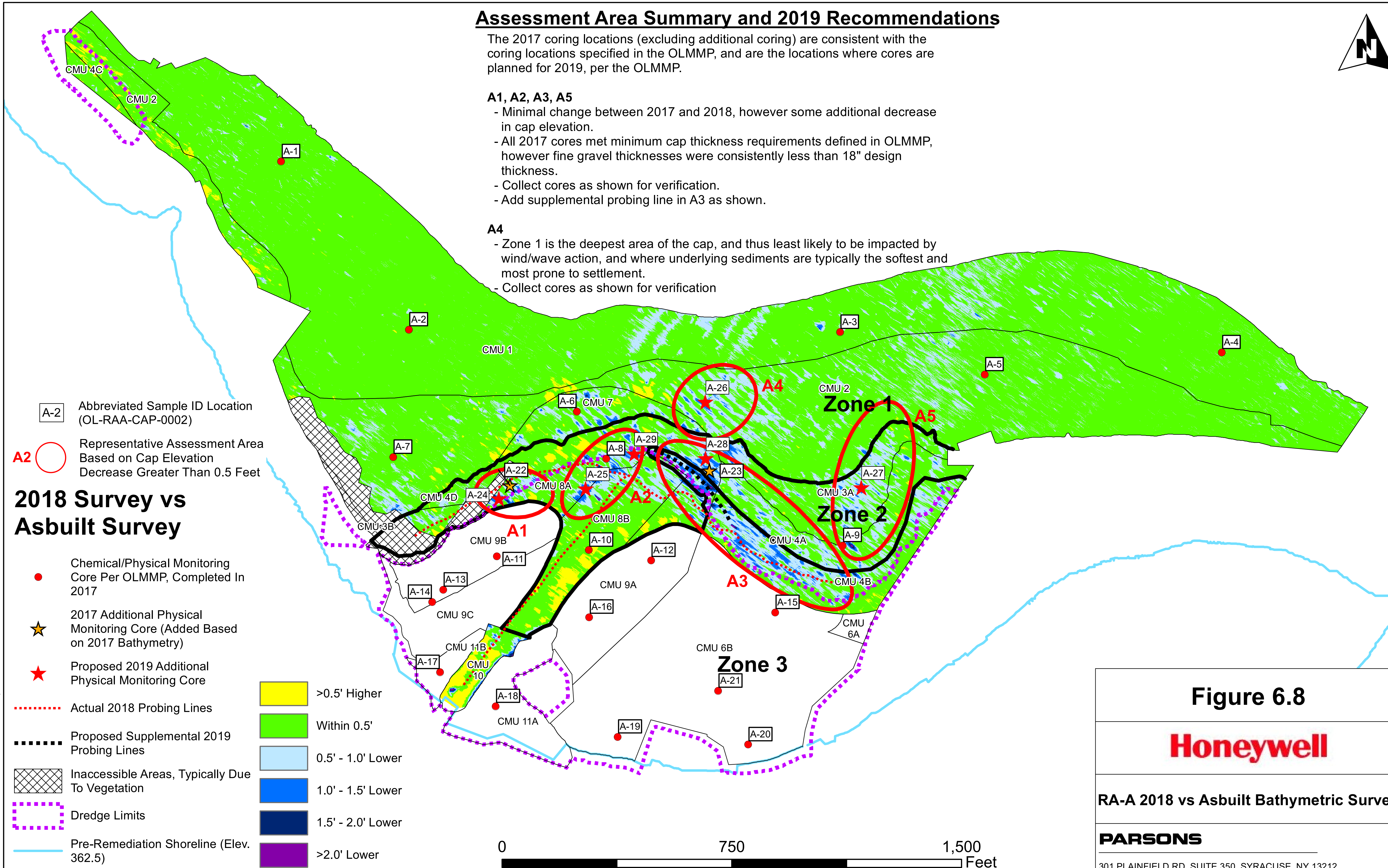
The 2017 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

A1, A2, A3, A5

- Minimal change between 2017 and 2018, however some additional decrease in cap elevation.
- All 2017 cores met minimum cap thickness requirements defined in OLMMP, however fine gravel thicknesses were consistently less than 18" design thickness.
- Collect cores as shown for verification.
- Add supplemental probing line in A3 as shown.

A4

- Zone 1 is the deepest area of the cap, and thus least likely to be impacted by wind/wave action, and where underlying sediments are typically the softest and most prone to settlement.
- Collect cores as shown for verification



2018 Survey vs Asbuilt Survey

A-2	Abbreviated Sample ID Location (OL-RAA-CAP-0002)
A2	Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet
	Chemical/Physical Monitoring Core Per OLMMP, Completed In 2017
	2017 Additional Physical Monitoring Core (Added Based on 2017 Bathymetry)
	Proposed 2019 Additional Physical Monitoring Core
	Actual 2018 Probing Lines
	Proposed Supplemental 2019 Probing Lines
	Inaccessible Areas, Typically Due To Vegetation
	Dredge Limits
	Pre-Remediation Shoreline (Elev. 362.5)

	>0.5' Higher
	Within 0.5'
	0.5' - 1.0' Lower
	1.0' - 1.5' Lower
	1.5' - 2.0' Lower
	>2.0' Lower

Figure 6.8

Honeywell

RA-A 2018 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Joshua Domanski

Plot Date: 5/16/2019

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAA OMM Survey 2018_Rev1.mxd

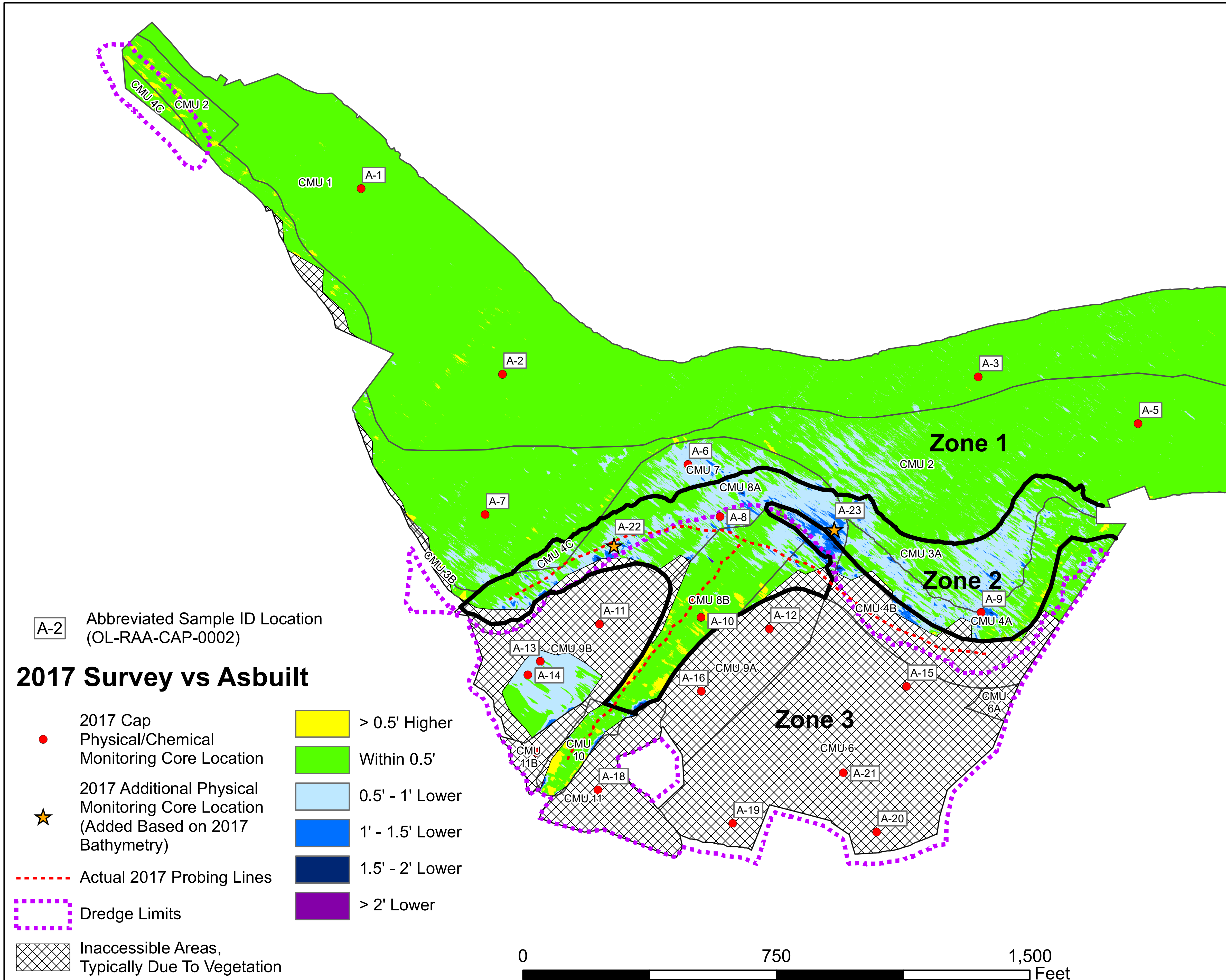


Figure 6.9

Honeywell

RA-A 2017 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\2019 Assessment Areas\Figure 6-7 - RAA Bathy_Rev1.mxd

Plot Date: 5/8/2019

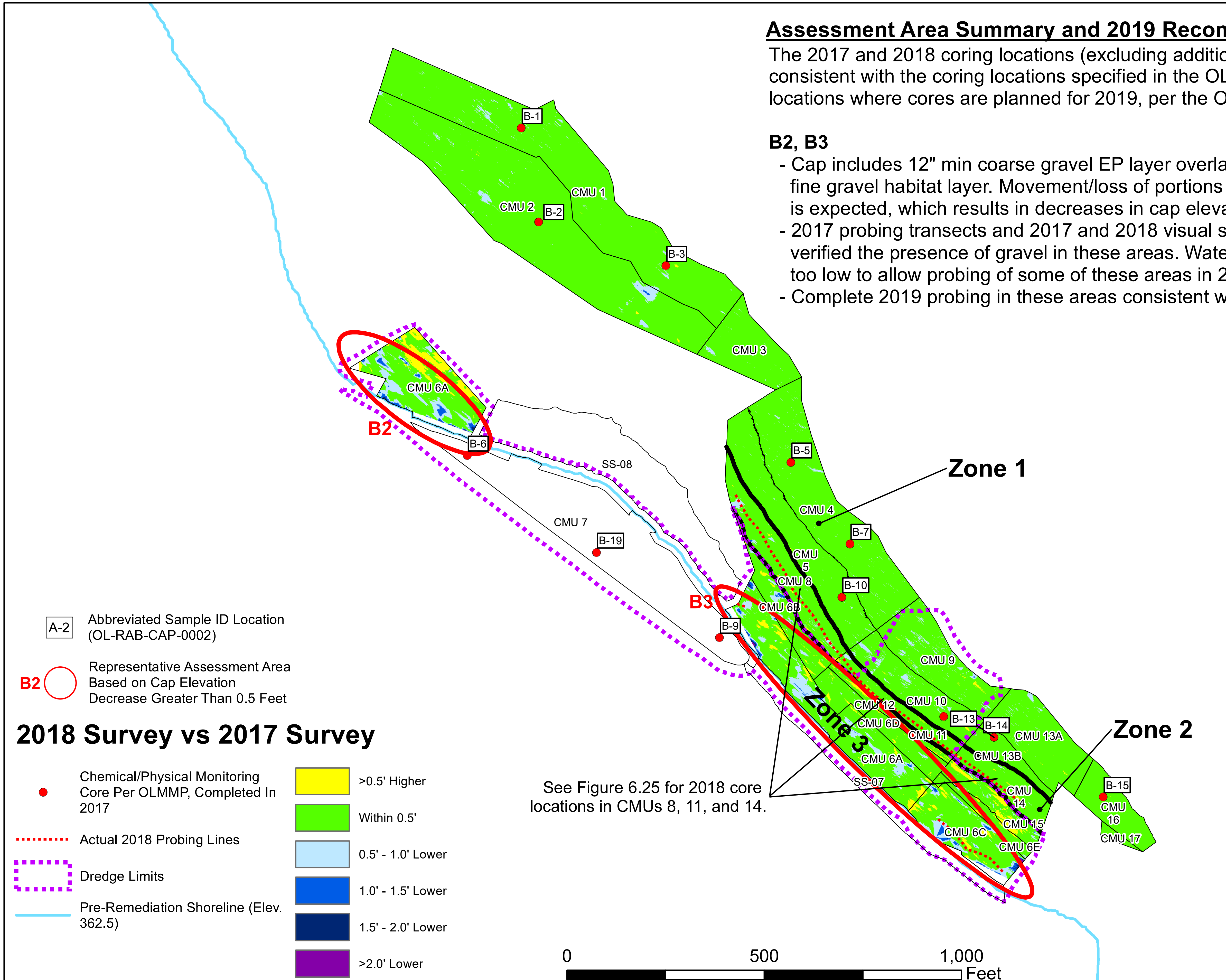
Plotted By: Joshua Domanski

Assessment Area Summary and 2019 Recommendations

The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

B2, B3

- Cap includes 12" min coarse gravel EP layer overlain by 12" min fine gravel habitat layer. Movement/loss of portions of the habitat layer is expected, which results in decreases in cap elevation.
- 2017 probing transects and 2017 and 2018 visual shoreline inspection verified the presence of gravel in these areas. Water elevations were too low to allow probing of some of these areas in 2018.
- Complete 2019 probing in these areas consistent with OLMMP



Plotted By: Joshua Domanski

Plot Date: 5/16/2019

Figure 6.10

Honeywell

RA-B 2018 vs 2017 Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

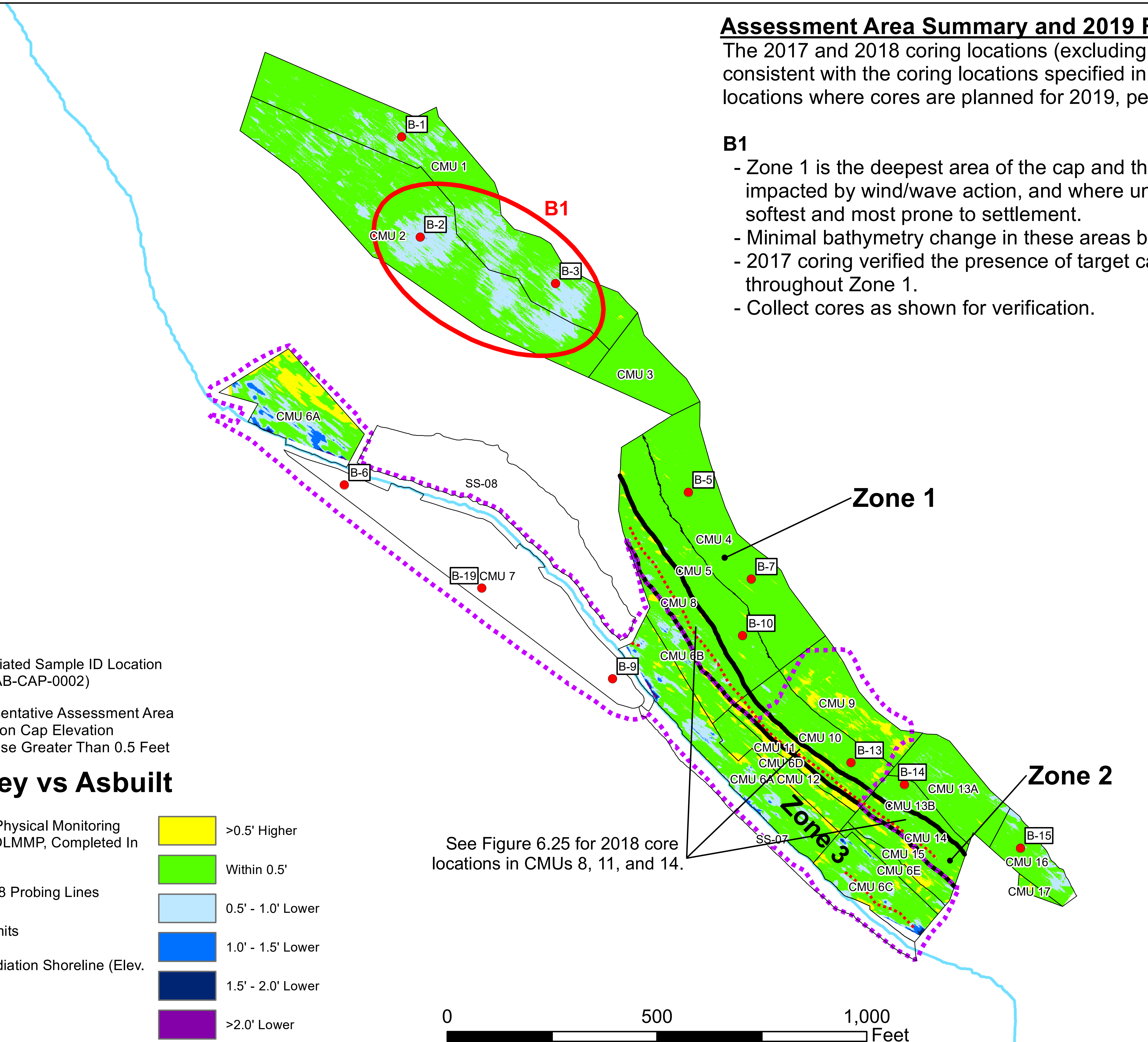
Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAB OMM Survey 2017 v 2018_Rev1.mxd

Assessment Area Summary and 2019 Recommendations

The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

B1

- Zone 1 is the deepest area of the cap and thus least likely to be impacted by wind/wave action, and where underlying sediments are softest and most prone to settlement.
- Minimal bathymetry change in these areas between 2017 and 2018.
- 2017 coring verified the presence of target cap thicknesses throughout Zone 1.
- Collect cores as shown for verification.



B-2 Abbreviated Sample ID Location (OL-RAB-CAP-0002)

B1 Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

2018 Survey vs Asbuilt

- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2017
- Actual 2018 Probing Lines
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

Figure 6.11

Honeywell

RA-B 2018 vs Asbuilt Bathymetric Survey

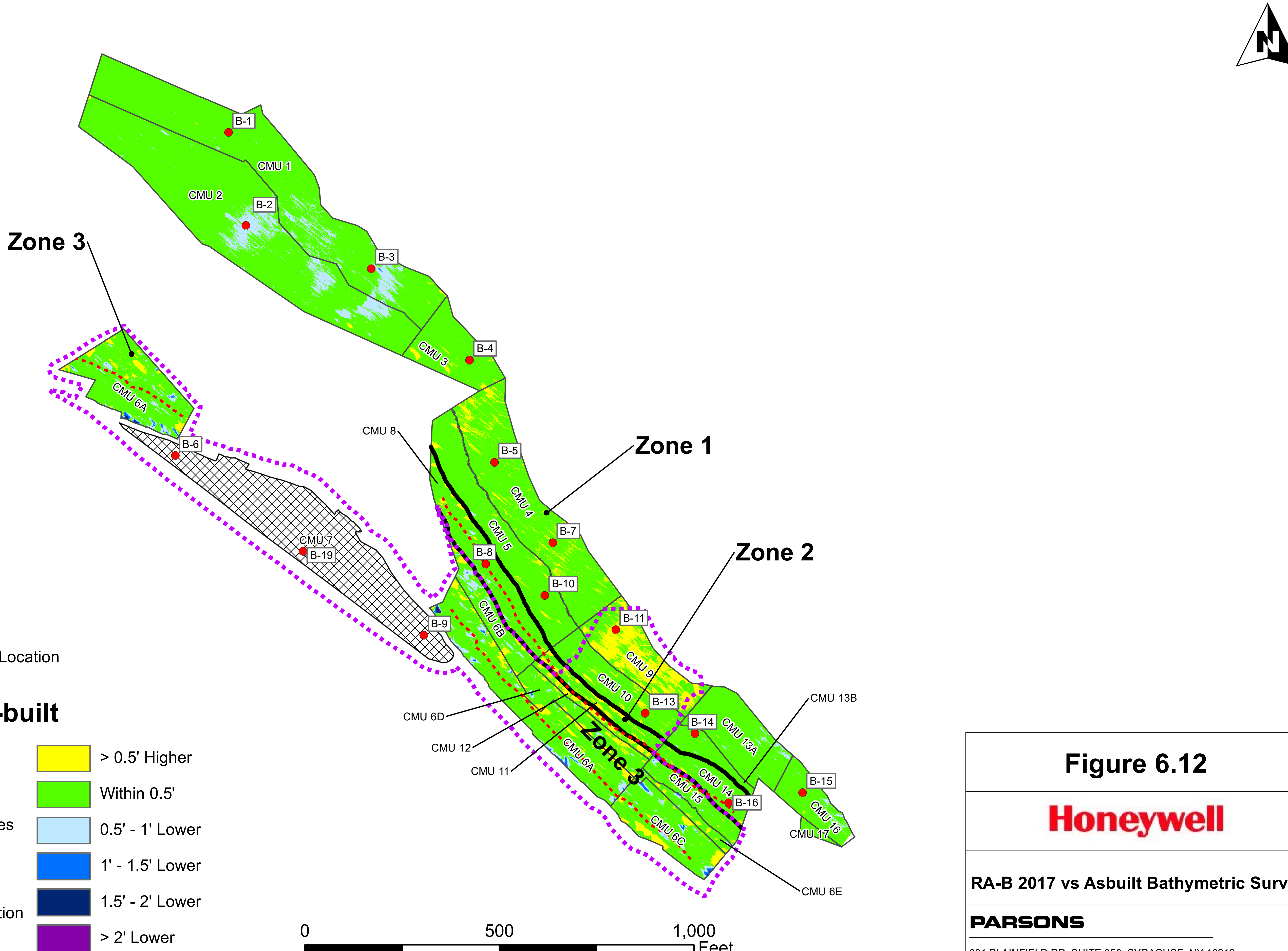
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Joshua Domanski

Plot Date: 5/16/2019

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAB OMM Survey 2018_Rev1.mxd



B-2 Abbreviated Sample ID Location (OL-RAB-CAP-0002)

2017 Survey vs As-built

- 2017 Physical/Chemical Cap Monitoring Core Location
- Actual 2017 Probing Lines
- Dredge Limits
- Inaccessible Areas, Typically Due To Vegetation

- > 0.5' Higher
- Within 0.5'
- 0.5' - 1' Lower
- 1' - 1.5' Lower
- 1.5' - 2' Lower
- > 2' Lower

Figure 6.12

Honeywell

RA-B 2017 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\2019 Assessment Areas\Figure 6-8 - RAB Bathy_Rev1.mxd

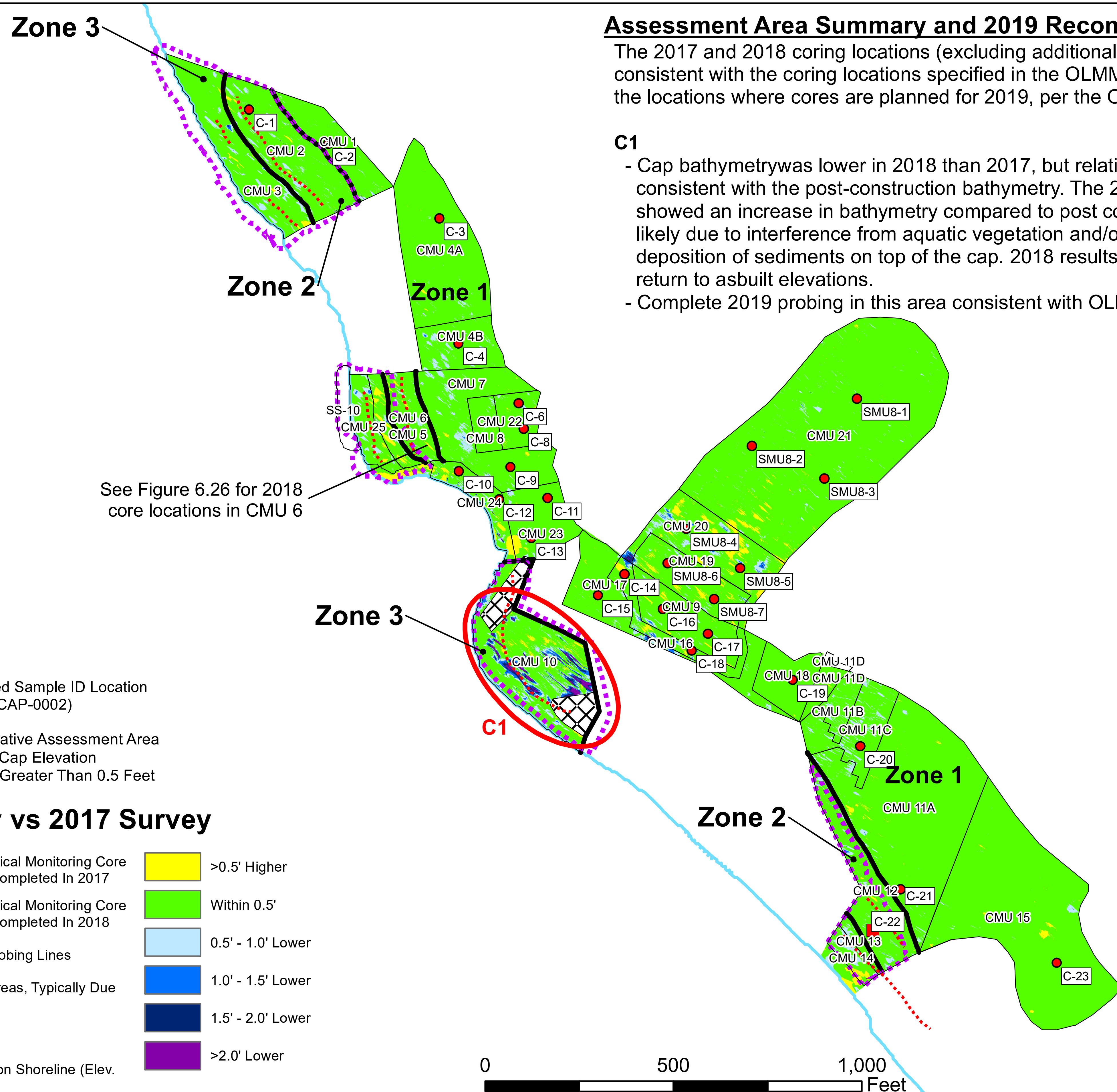
Plot Date: 5/8/2019 Plotted By: Joshua Domanski

Assessment Area Summary and 2019 Recommendations

The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

C1

- Cap bathymetrywas lower in 2018 than 2017, but relatively consistent with the post-construction bathymetry. The 2017 bathymetry showed an increase in bathymetry compared to post construction, likely due to interference from aquatic vegetation and/or temporary deposition of sediments on top of the cap. 2018 results indicate a return to asbuilt elevations.
- Complete 2019 probing in this area consistent with OLMMP



C-2 Abbreviated Sample ID Location (OL-RAC-CAP-0002)

C1 Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

2018 Survey vs 2017 Survey

- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2017
- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2018
- Actual 2018 Probing Lines
- Inaccessible Areas, Typically Due To Vegetation
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

Plotted By: Joshua Domanski

Plot Date: 5/16/2019

Figure 6.13

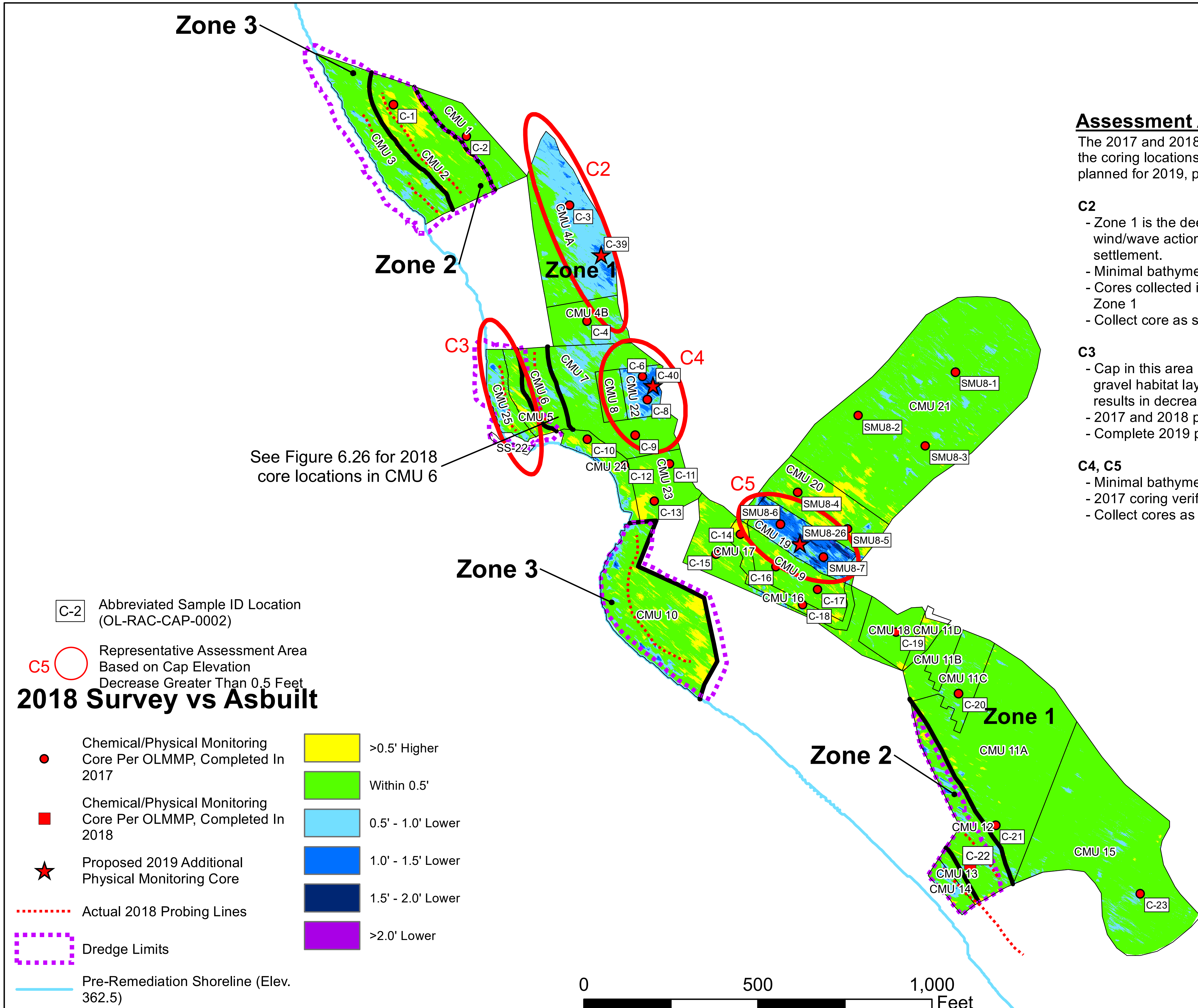
Honeywell

RA-C 2018 vs 2017 Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAC OMM Survey 2017 v 2018_Rev1.mxd



Assessment Area Summary and 2019 Recommendations

The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

C2

- Zone 1 is the deepest area of the cap and thus least likely to be impacted by wind/wave action, and where underlying sediments are softest and most prone to settlement.
- Minimal bathymetry change in these areas between 2017 and 2018.
- Cores collected in 2017 verified the presence of target cap thickness throughout Zone 1
- Collect core as shown for verification.

C3

- Cap in this area includes 12" min coarse gravel EP layer overlain by 12" min fine gravel habitat layer. Movement/loss of portions of the habitat layer is expected, which results in decreases in cap elevation.
- 2017 and 2018 probing transects verified the presence of gravel in this area.
- Complete 2019 probing in this area consistent with OLMMP.

C4, C5

- Minimal bathymetry change in these areas between 2017 and 2018.
- 2017 coring verified the presence of target cap thickness in these areas.
- Collect cores as shown for verification.

Figure 6.14

Honeywell

RA-C 2018 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Joshua Domanski

Plot Date: 5/21/2019

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAC OMM Survey 2018_Rev1.mxd

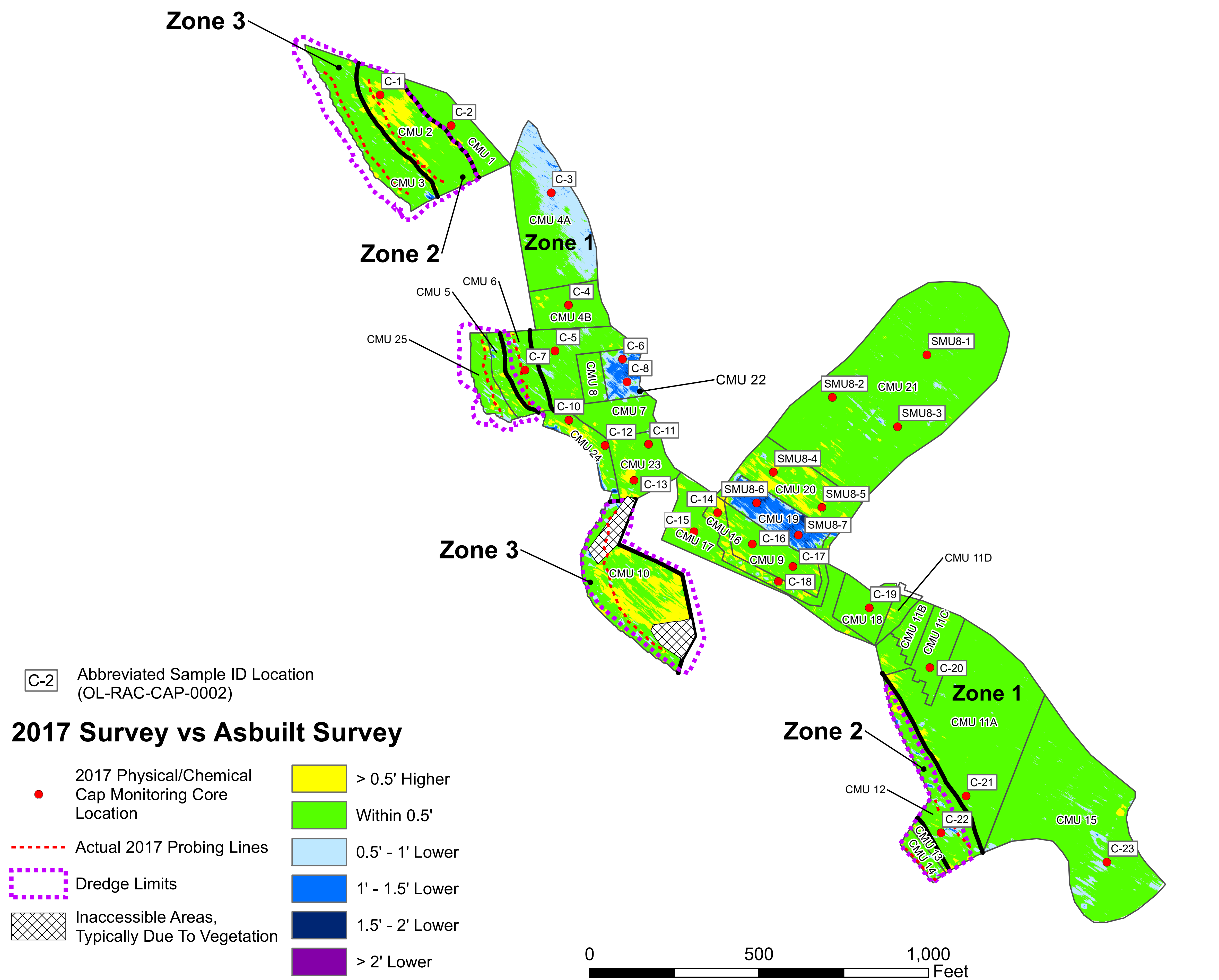


Figure 6.15

Honeywell

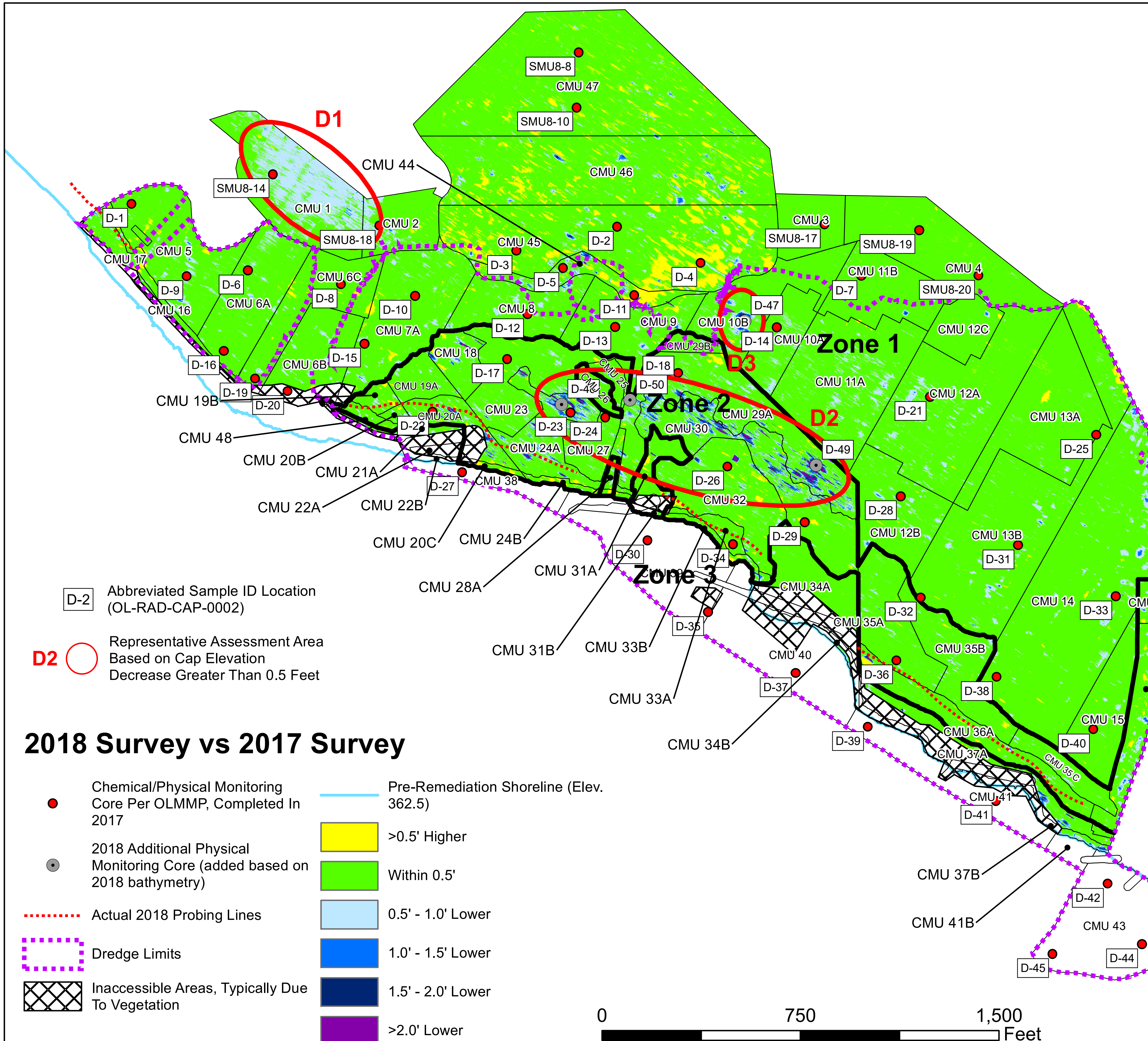
RA-C 2017 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\2019 Assessment Areas\Figure 6-9 - RAC Bathy_Rev1.mxd

Plot Date: 5/16/2019 Plotted By: Joshua Domanski



Assessment Area Summary and 2019 Recommendations

The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

D1

- Zone 1 is the deepest area of the cap and thus least likely to be impacted by wind/wave action, and where underlying sediments are softest and most prone to settlement.
- Cores collected in 2017 verified the presence of target cap thicknesses in this area.
- Collect core as shown for verification.

D2, D3

- Cap bathymetry was lower in 2018 than 2017, but relatively consistent with the post-construction bathymetry. The 2017 bathymetry showed an increase in bathymetry compared to post-construction, likely due to interference from aquatic vegetation and/or temporary deposition of sediments on top of the cap. 2018 results indicate a resturn to asbuilt elevations.
- Cores collected in 2017 and 2018 verified the presence of target cap thicknesses in this area.
- No evidence of loss of cap material
- Collect cores as shown for verification.
- D-48 showed sufficient gravel tickness but did not fully penetrate the chemical isolation layer, so it will be re-cored in 2019.

Figure 6.16

Honeywell

RA-D 2018 vs 2017 Bathymetric Survey

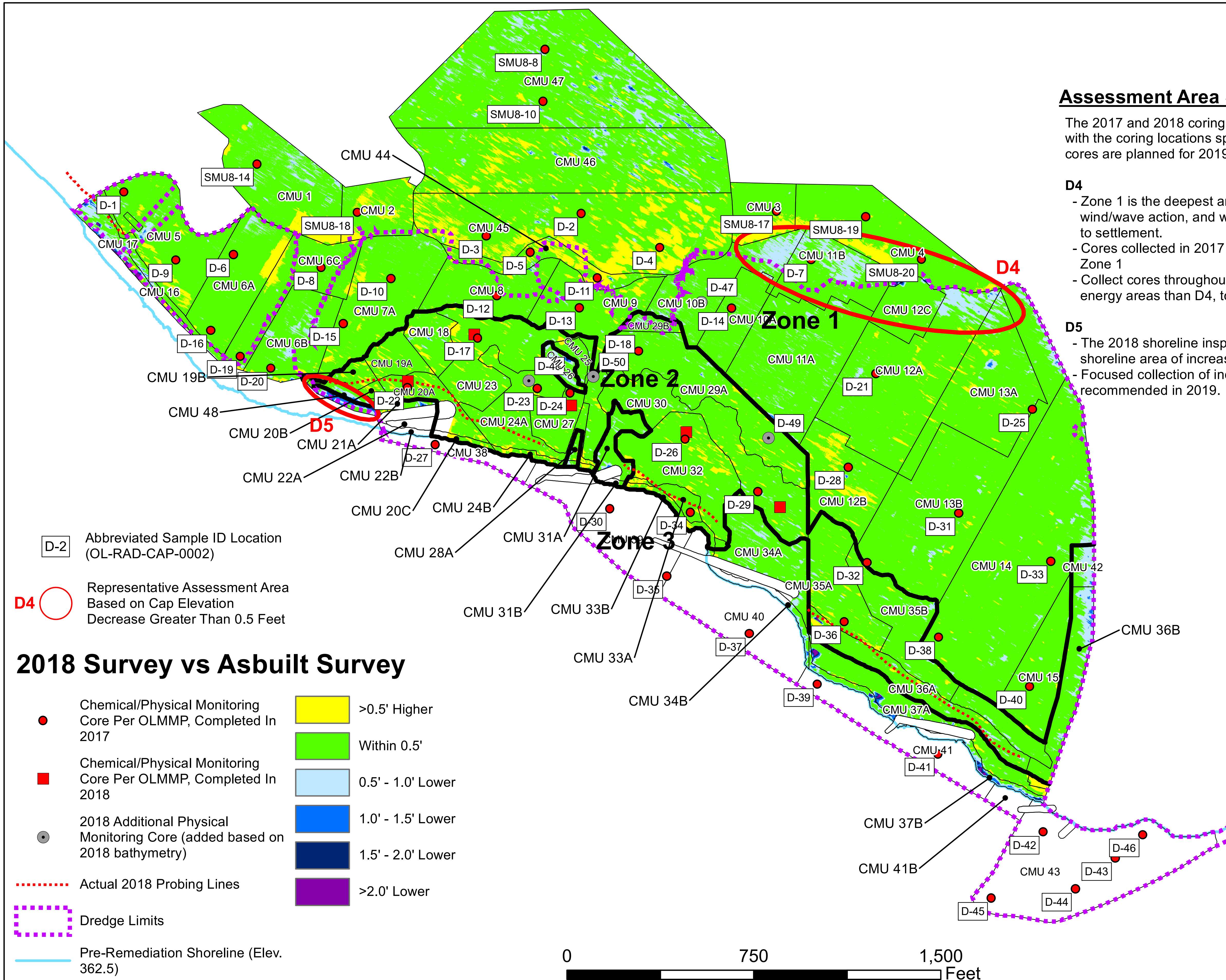
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Joshua Domanski

Plot Date: 5/20/2019

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAD OMM Survey 2017 v 2018_Rev1.mxd



Assessment Area Summary and 2019 Recommendations

The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

D4

- Zone 1 is the deepest area of the cap and thus least likely to be impacted by wind/wave action, and where underlying settlements are softest and most prone to settlement.
- Cores collected in 2017 verified the presence of target cap thicknesses throughout Zone 1
- Collect cores throughout Zone 1 as shown, including shallower and thus higher energy areas than D4, to verify stability of sand cap.

D5

- The 2018 shoreline inspection and zooming in on this area identified a localized shoreline area of increased bathymetry.
- Focused collection of increased bathymetry data and physical inspection recommended in 2019.

D-2 Abbreviated Sample ID Location (OL-RAD-CAP-0002)

D4 Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

2018 Survey vs Asbuilt Survey

- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2017
- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2018
- 2018 Additional Physical Monitoring Core (added based on 2018 bathymetry)
- Actual 2018 Probing Lines
- Dredge Limits
- Pre-Remediation Shoreline (Elev. 362.5)

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower

Figure 6.17

Honeywell

RA-D 2018 vs Asbuilt Bathymetric Survey

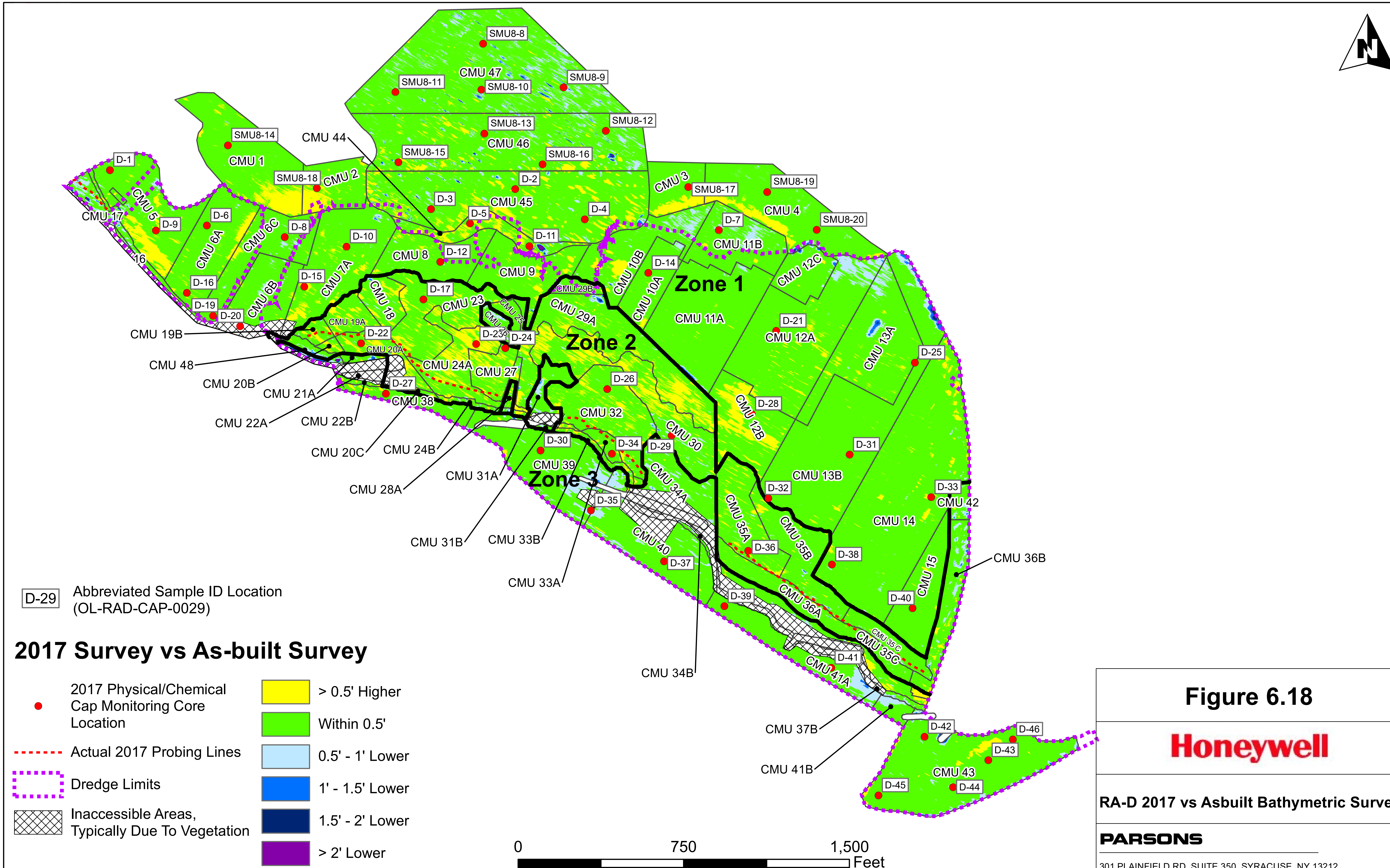
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Plotted By: Joshua Domanski

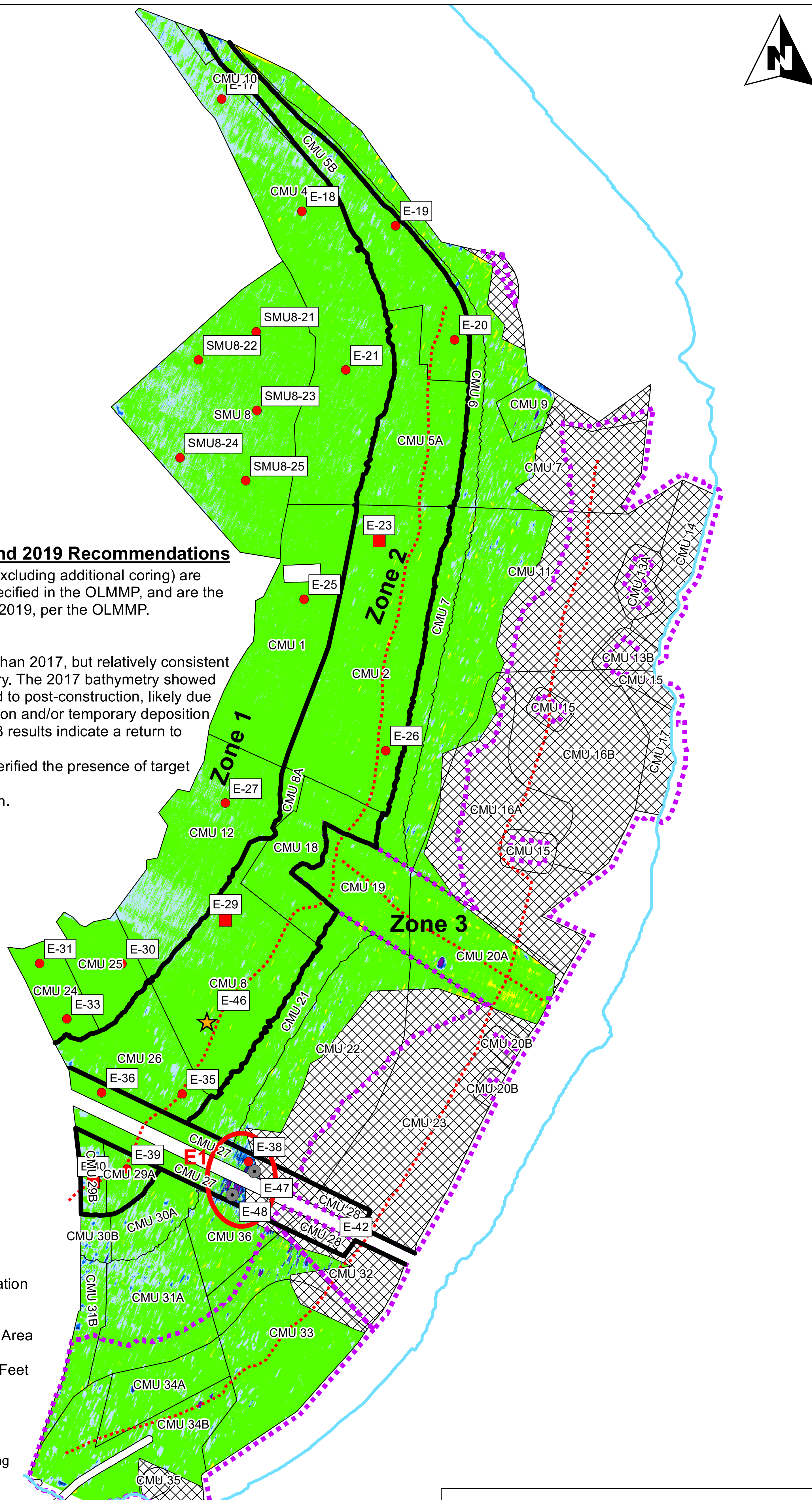
Plot Date: 5/17/2019

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAD OMM Survey 2018_Rev1.mxd



Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\2019 Assessment Areas\Figure 6-10 - RAD Bathy_Rev1.mxd

Plot Date: 5/17/2019 Plotted By: Joshua Domanski



Assessment Area Summary and 2019 Recommendations

The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

E1

- Cap bathymetry was lower in 2018 than 2017, but relatively consistent with the post-construction bathymetry. The 2017 bathymetry showed an increase in bathymetry compared to post-construction, likely due to interference from aquatic vegetation and/or temporary deposition of sediments on top of the cap. 2018 results indicate a return to asbuilt elevations.
- Cores collected in 2017 and 2018 verified the presence of target cap thickness.
- Collect core as shown for verification.

E-2 Abbreviated Sample ID Location (OL-RAE-CAP-0002)

E1 Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

2018 Survey vs 2017 Survey

- 2017 Additional Physical Monitoring Core (Added Based On 2017 Bathymetry Results)
- Chemical/Physical monitoring Core Per OLMMP, Completed In 2017
- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2018
- 2018 Additional Physical Monitoring Core (added based on 2018 bathymetry)
- Actual 2018 Probing Lines
- Dredge Outlines
- Inaccessible Areas, Typically Due To Vegetation

- >0.5' Higher
- Within 0.5'
- 0.5' - 1.0' Lower
- 1.0' - 1.5' Lower
- 1.5' - 2.0' Lower
- >2.0' Lower
- Pre-Remediation Shoreline (Elev. 362.5)

0 700 1,400 Feet

Figure 6.19

Honeywell

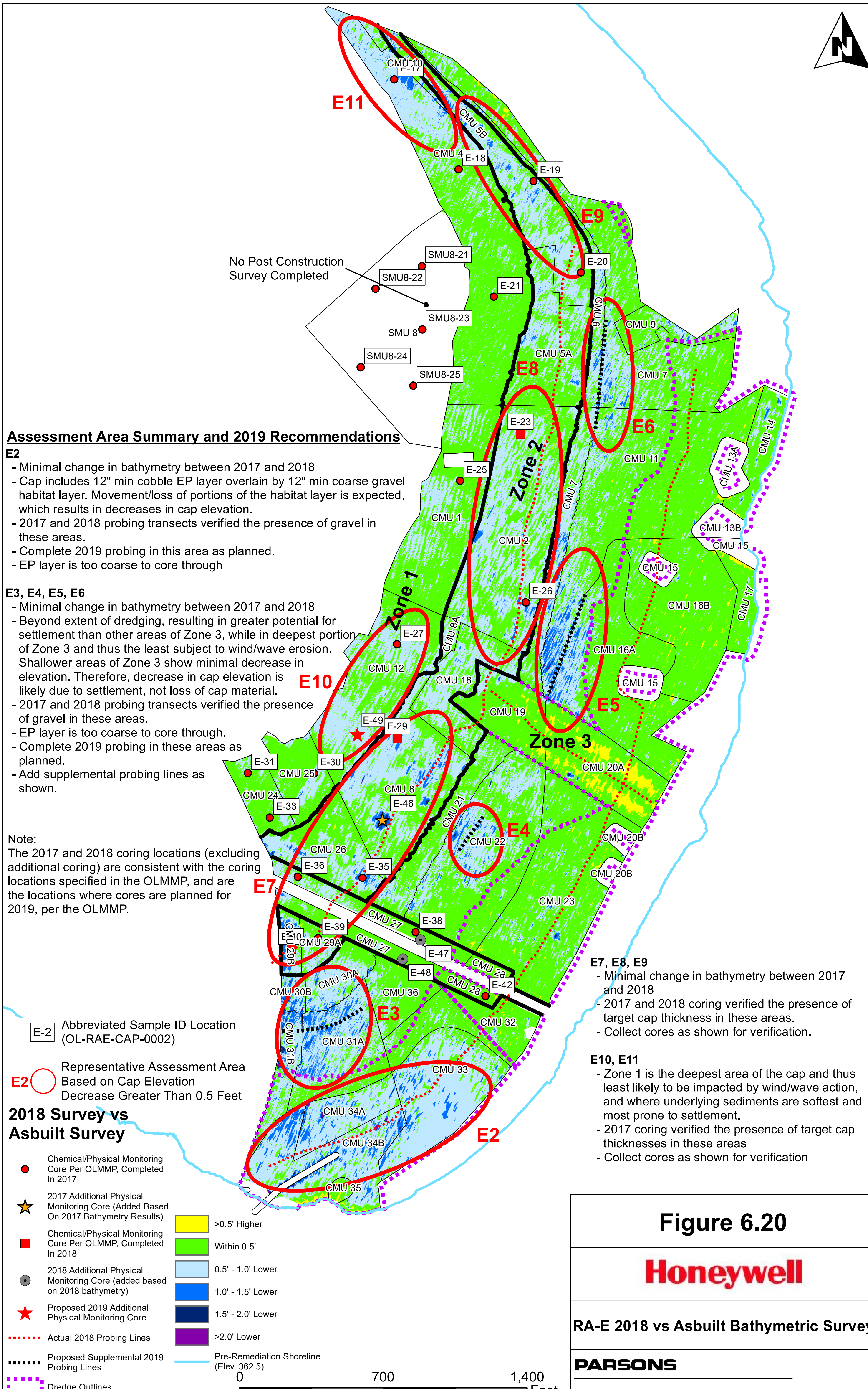
RA-E 2018 vs 2017 Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAE OMM Survey 2017 v 2018_Rev1.mxd

Plot Date: 5/17/2019 Plotted By: Joshua Domanski



Assessment Area Summary and 2019 Recommendations

E2
- Minimal change in bathymetry between 2017 and 2018
- Cap includes 12" min cobble EP layer overlain by 12" min coarse gravel habitat layer. Movement/loss of portions of the habitat layer is expected, which results in decreases in cap elevation.
- 2017 and 2018 probing transects verified the presence of gravel in these areas.
- Complete 2019 probing in this area as planned.
- EP layer is too coarse to core through

E3, E4, E5, E6
- Minimal change in bathymetry between 2017 and 2018
- Beyond extent of dredging, resulting in greater potential for settlement than other areas of Zone 3, while in deepest portion of Zone 3 and thus the least subject to wind/wave erosion. Shallower areas of Zone 3 show minimal decrease in elevation. Therefore, decrease in cap elevation is likely due to settlement, not loss of cap material.
- 2017 and 2018 probing transects verified the presence of gravel in these areas.
- EP layer is too coarse to core through.
- Complete 2019 probing in these areas as planned.
- Add supplemental probing lines as shown.

Note:
The 2017 and 2018 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

E7, E8, E9
- Minimal change in bathymetry between 2017 and 2018
- 2017 and 2018 coring verified the presence of target cap thickness in these areas.
- Collect cores as shown for verification.

E10, E11
- Zone 1 is the deepest area of the cap and thus least likely to be impacted by wind/wave action, and where underlying sediments are softest and most prone to settlement.
- 2017 coring verified the presence of target cap thicknesses in these areas
- Collect cores as shown for verification

Figure 6.20

Honeywell

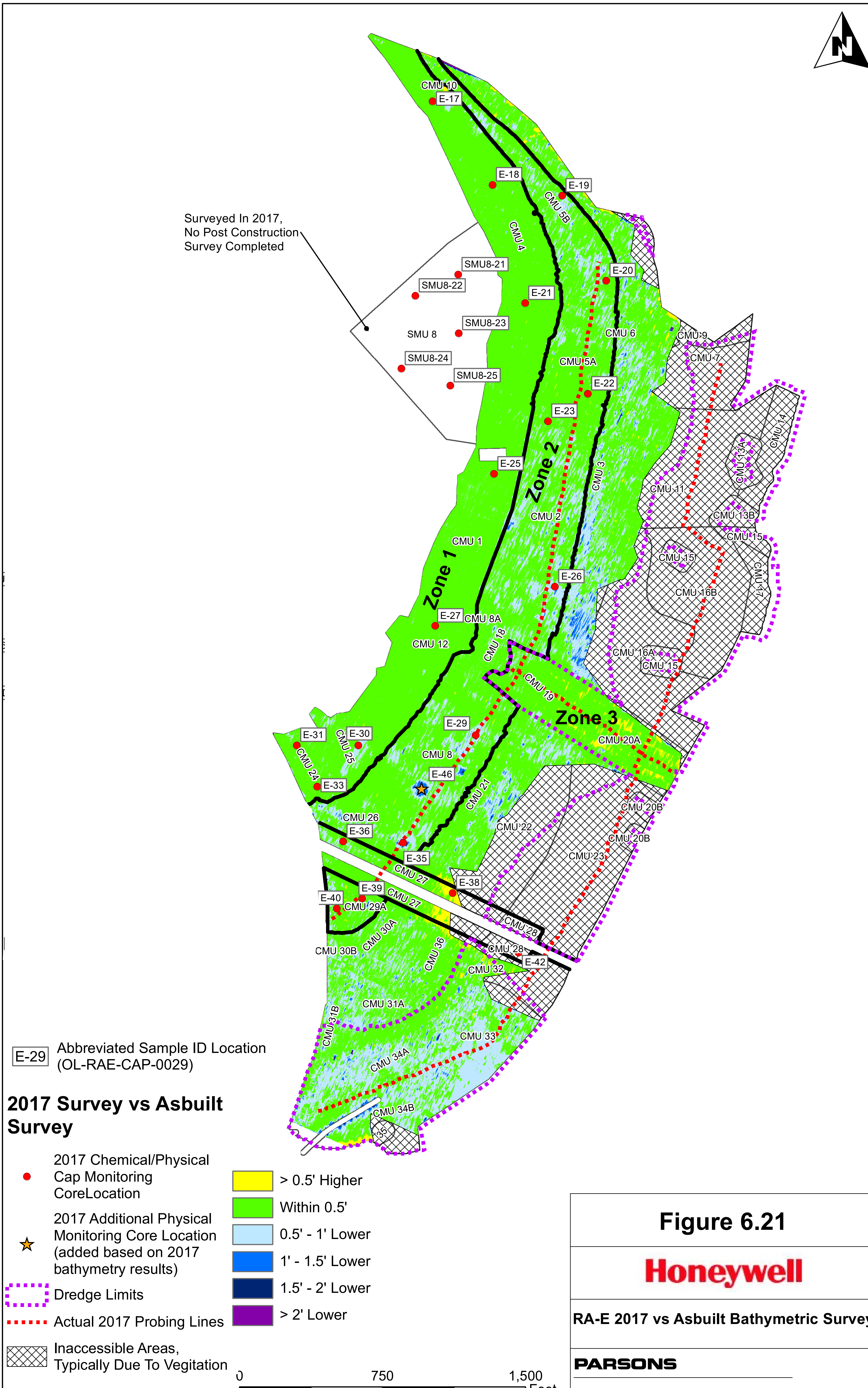
RA-E 2018 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

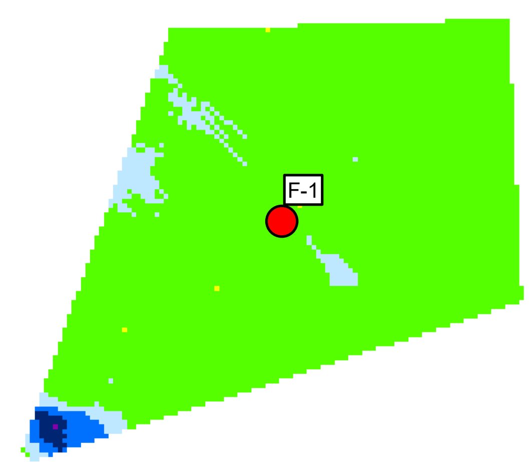
Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAE OMM Survey 2018_Rev1.mxd

Plot Date: 5/17/2019 Plotted By: Joshua Domanski



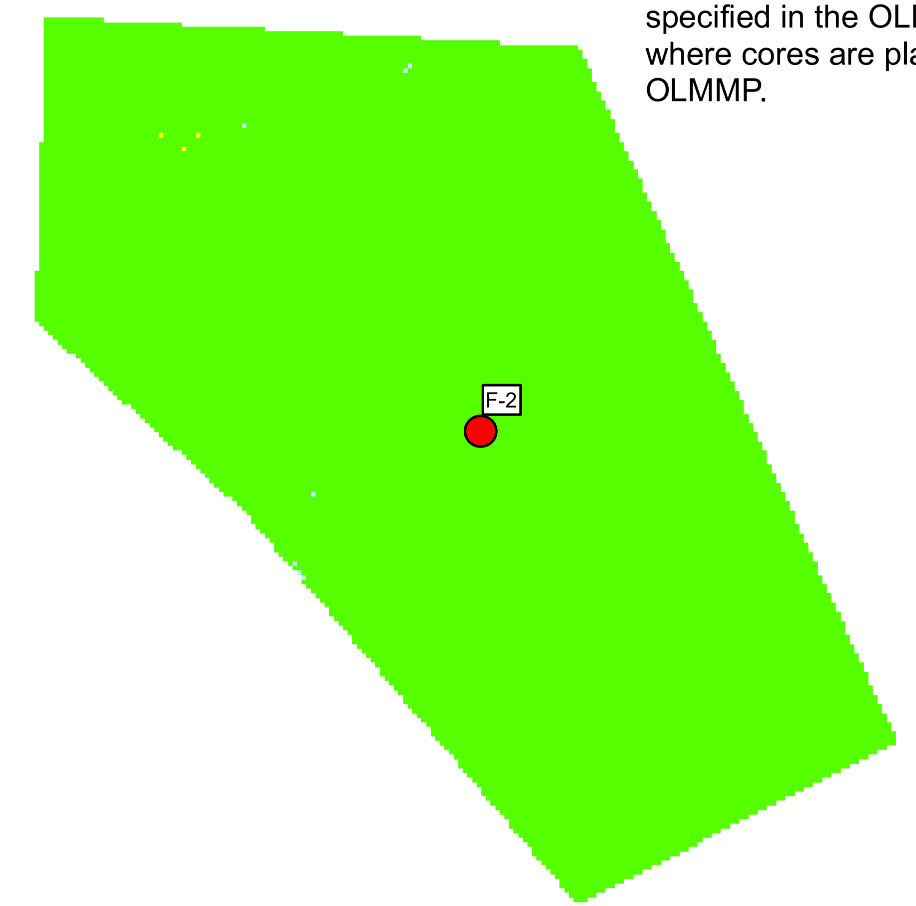
Document Path: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\2019 Assessment Areas\Figure 6-11 - RAE Bathy_Rev1.mxd
Plot Date: 5/17/2019 Plotted By: Joshua Domanski

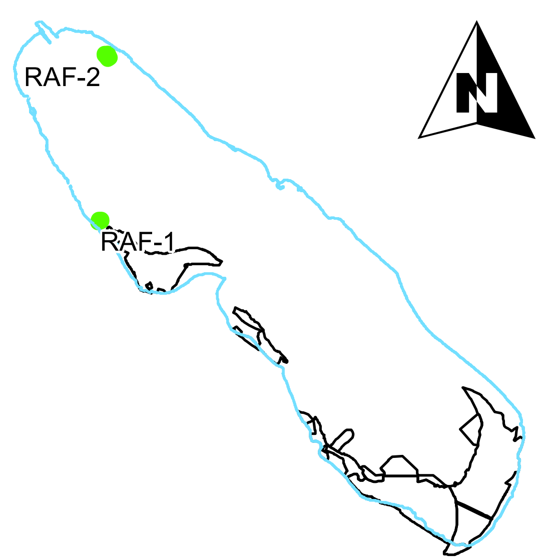
RA-F 1



RA-F 2

Note:
The 2017 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.





2018 Survey vs 2017 Survey

- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2017
- Pre-Remediation Shoreline (Elev. 362.5)
- > 0.5' Higher
- Within 0.5'
- 0.5' - 1' Lower
- 1' - 1.5' Lower
- 1.5' - 2' Lower
- > 2' Lower
- F-2 Abbreviated Sample ID Location (OL-RAF-CAP-0002)

0 50 100 Feet

Figure 6.22

Honeywell

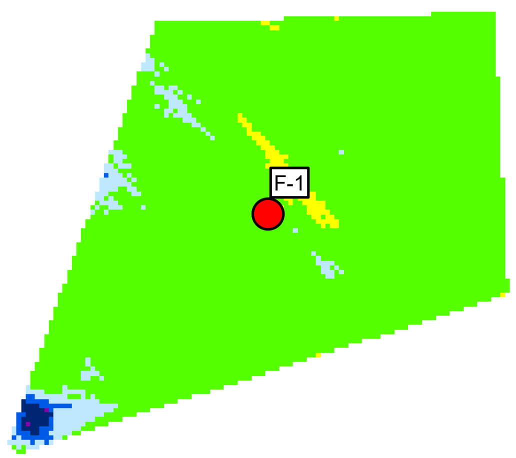
RA-F 2018 vs 2017 Bathymetric Survey

PARSONS

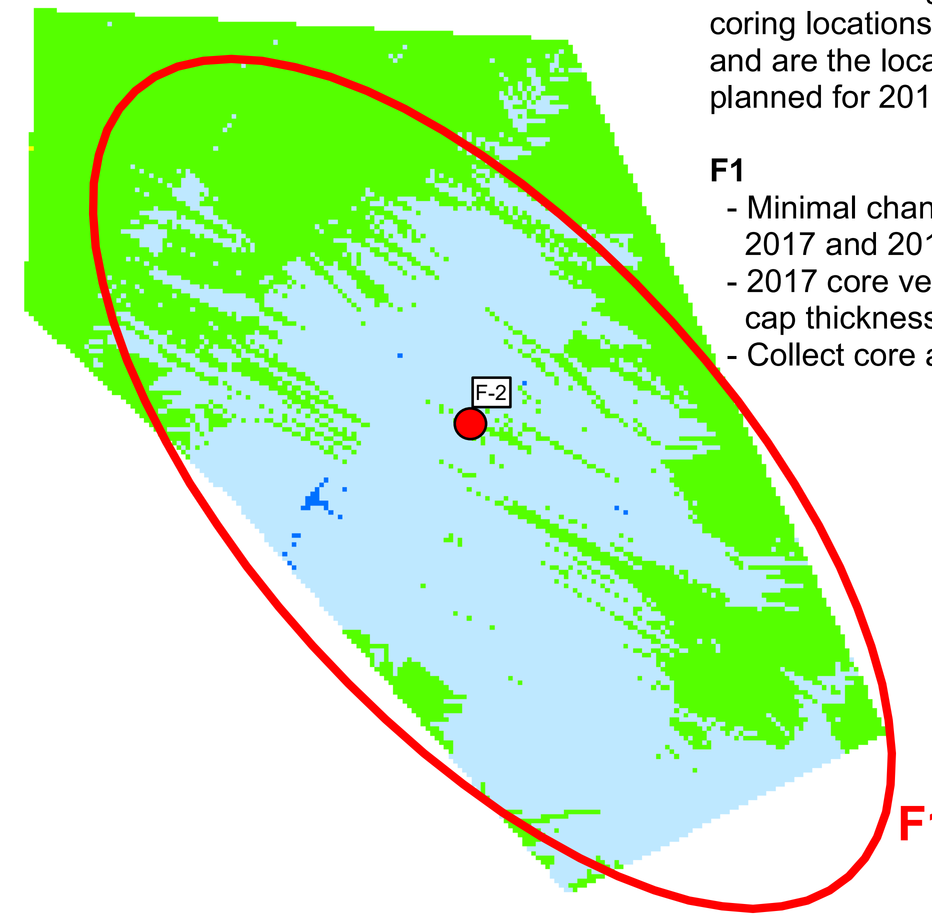
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAF OMM Survey 2017 v 2018 Rev2.mxd
Plot Date: 5/7/2019 Plotted By: Joshua Domanski

RA-F 1



RA-F 2

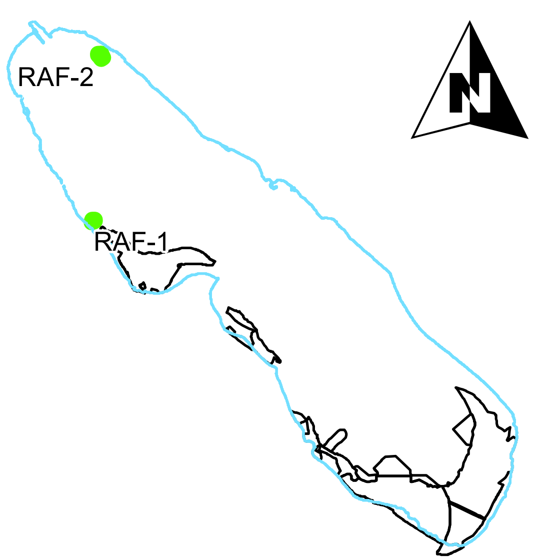


Assessment Area Summary and 2019 Recommendations

The 2017 coring locations (excluding additional coring) are consistent with the coring locations specified in the OLMMP, and are the locations where cores are planned for 2019, per the OLMMP.

F1

- Minimal change in bathymetry between 2017 and 2018.
- 2017 core verified the presence of target cap thickness
- Collect core as shown for verification



2018 Survey vs Asbuilt

- Chemical/Physical Monitoring Core Per OLMMP, Completed In 2017
- Pre-Remediation Shoreline (Elev. 362.5)
- > 0.5' Higher
- Within 0.5'
- F-2 Abbreviated Sample ID Location (OL-RAF-CAP-0002)
- 0.5' - 1' Lower
- 1' - 1.5' Lower
- 1.5' - 2' Lower
- > 2' Lower
- F1 Representative Assessment Area Based on Cap Elevation Decrease Greater Than 0.5 Feet

0 50 100 Feet

Figure 6.23

Honeywell

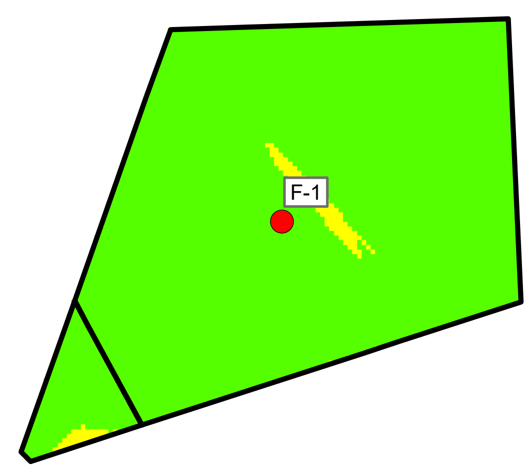
RA-F 2018 vs Asbuilt Bathymetric Survey

PARSONS

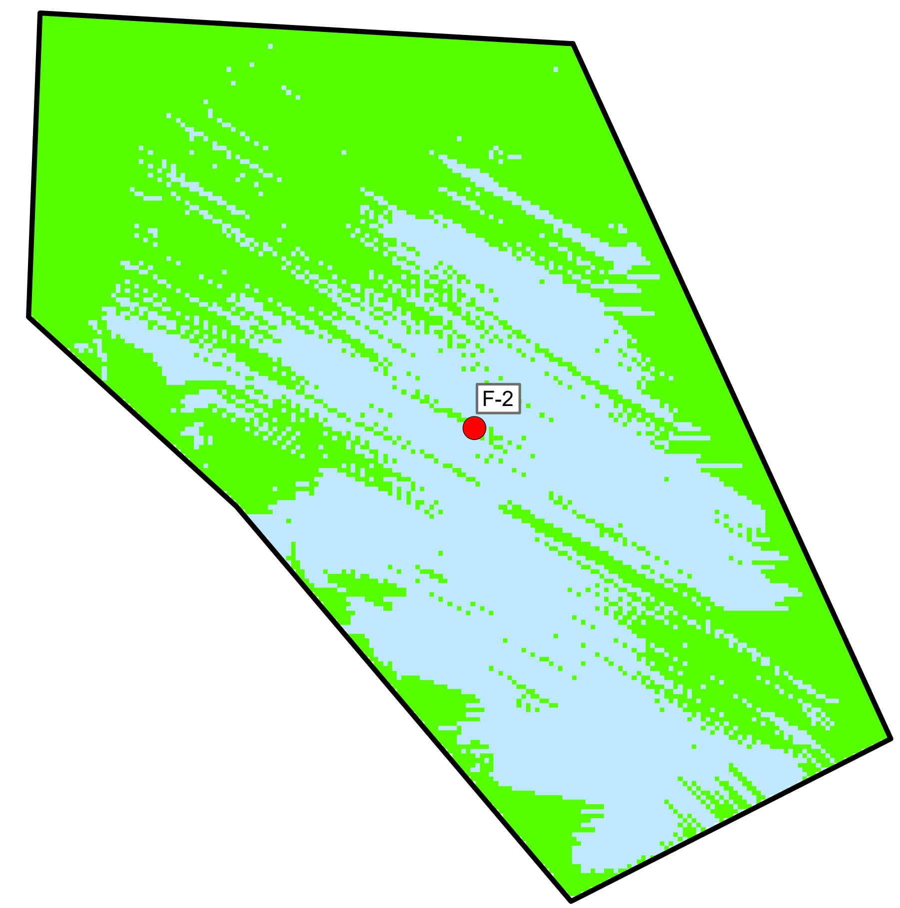
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

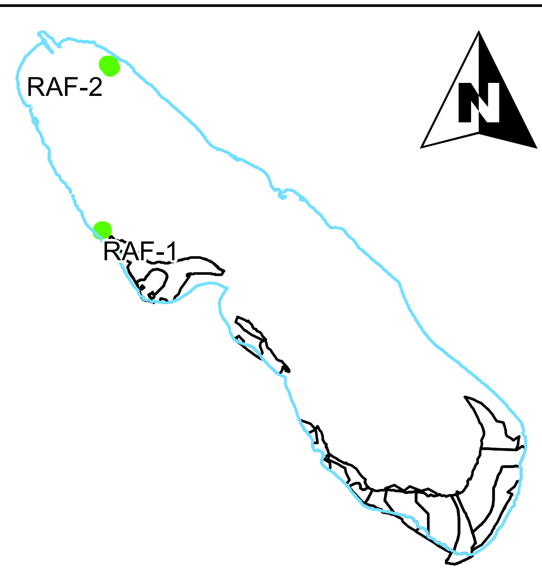
File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\RAF OMM Survey 2018 Rev2.mxd
Plot Date: 5/7/2019 Plotted By: Joshua Domanski

RA-F 1



RA-F 2





2017 Survey vs As-built Survey

- ● 2017 Chemical/Physical Cap Monitoring Core Location
- > 0.5' Higher
- Within 0.5'
- 0.5' - 1' Lower
- 1' - 1.5' Lower
- 1.5' - 2' Lower
- > 2' Lower
- F-2 Abbreviated Sample ID Location (OL-RAE-CAP-0029)

0 50 100 Feet

Figure 6.24

Honeywell

RA-F 2017 vs Asbuilt Bathymetric Survey

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\OMM Survey\2018 Survey\MXDs\2019 Assessment Areas\Figure 6-12 - RAF Bathy_Rev1.mxd
Plot Date: 4/16/2019 Plotted By: Joshua Domanski

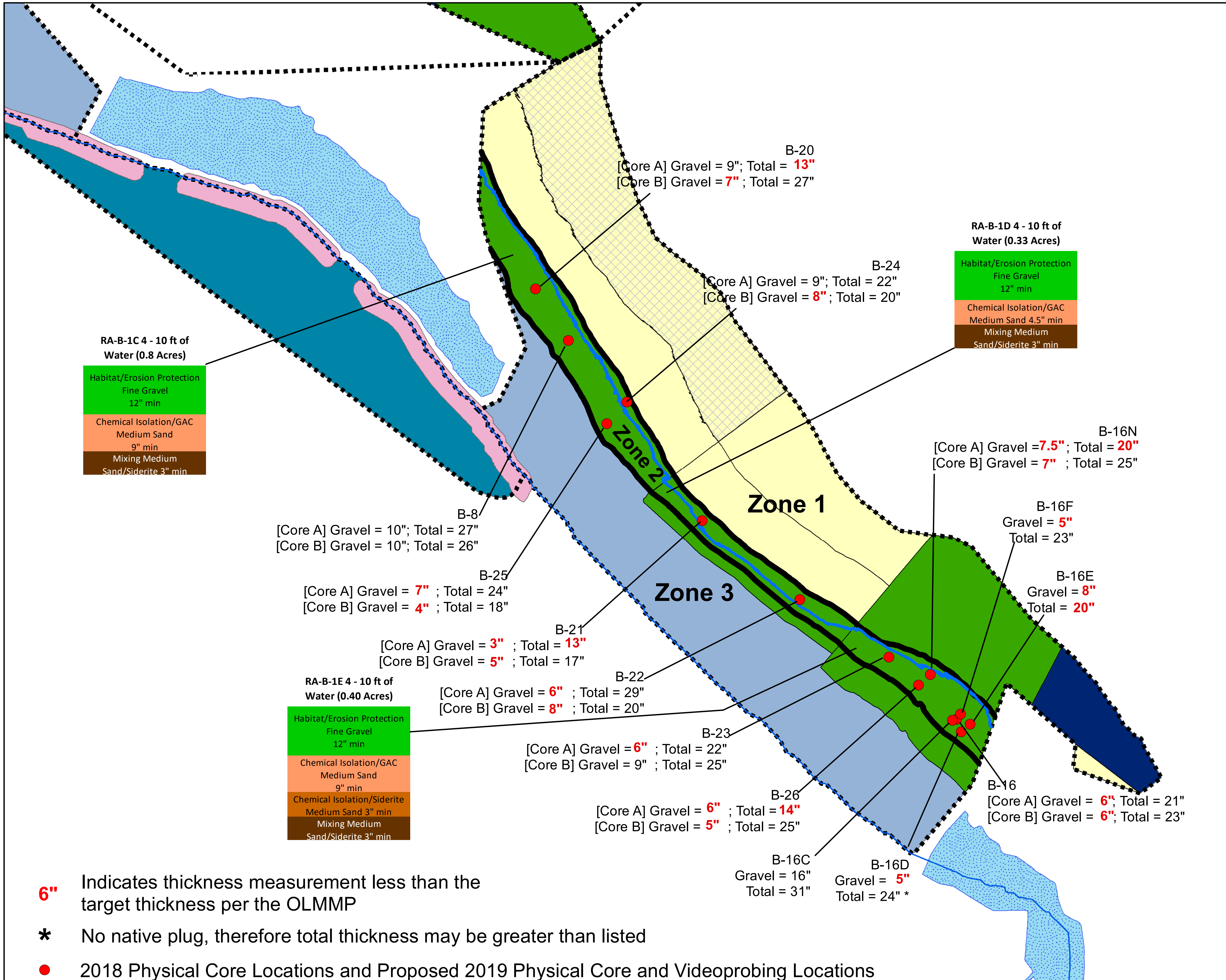


FIGURE 6.25

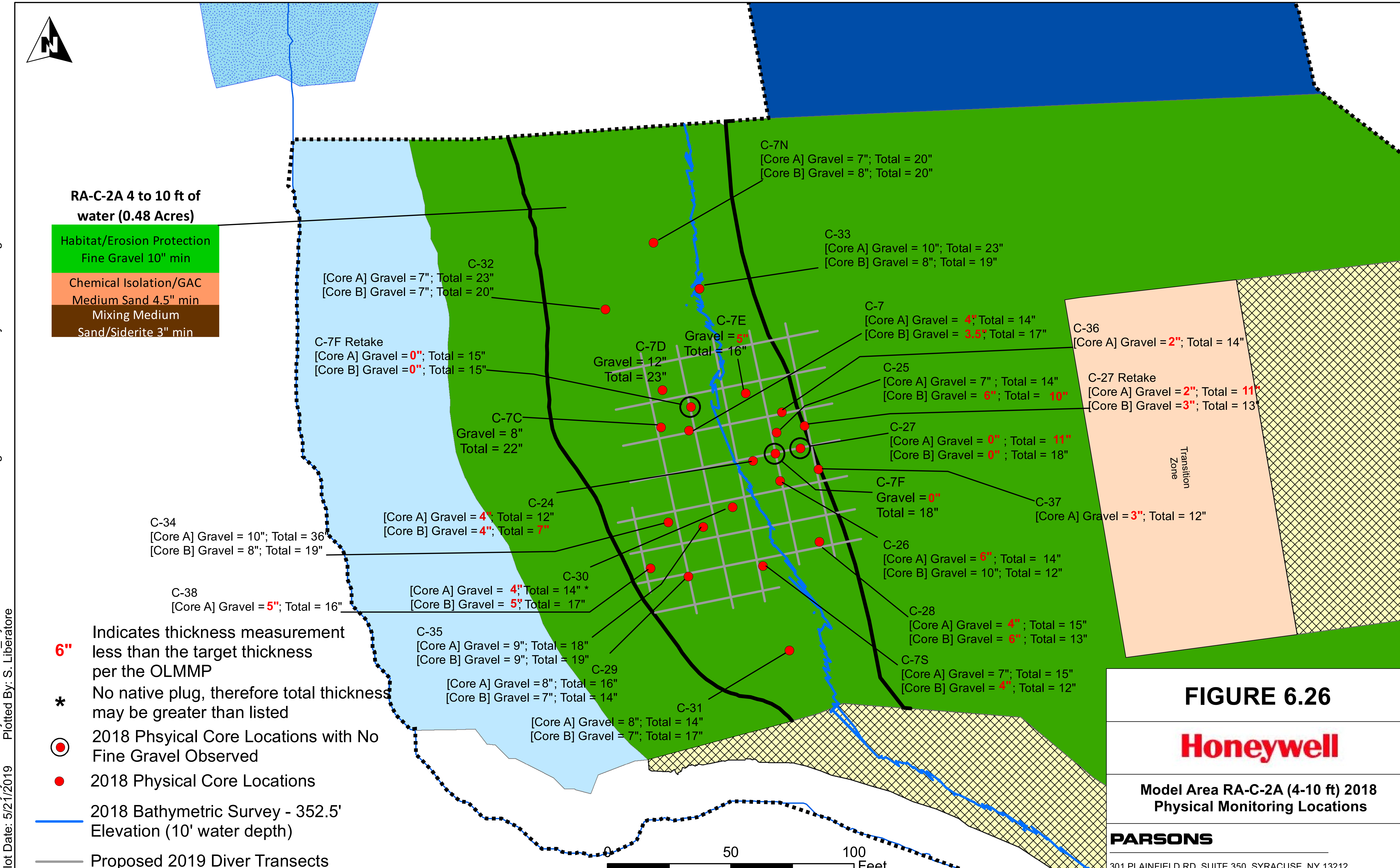
Honeywell

RA-B Zone 2 2018 Physical Monitoring and Proposed 2019 Physical Monitoring Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\2019\Figure 6.25 RAB 2018 2019 Physical Monitoring.mxd
Plot Date: 5/21/2019 Plotted By: Joshua Domanski



File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\2019\Figure 6.26 RAC 2018 Physical Monitoring rev1.mxd
Plot Date: 5/21/2019 Plotted By: S. Liberatore

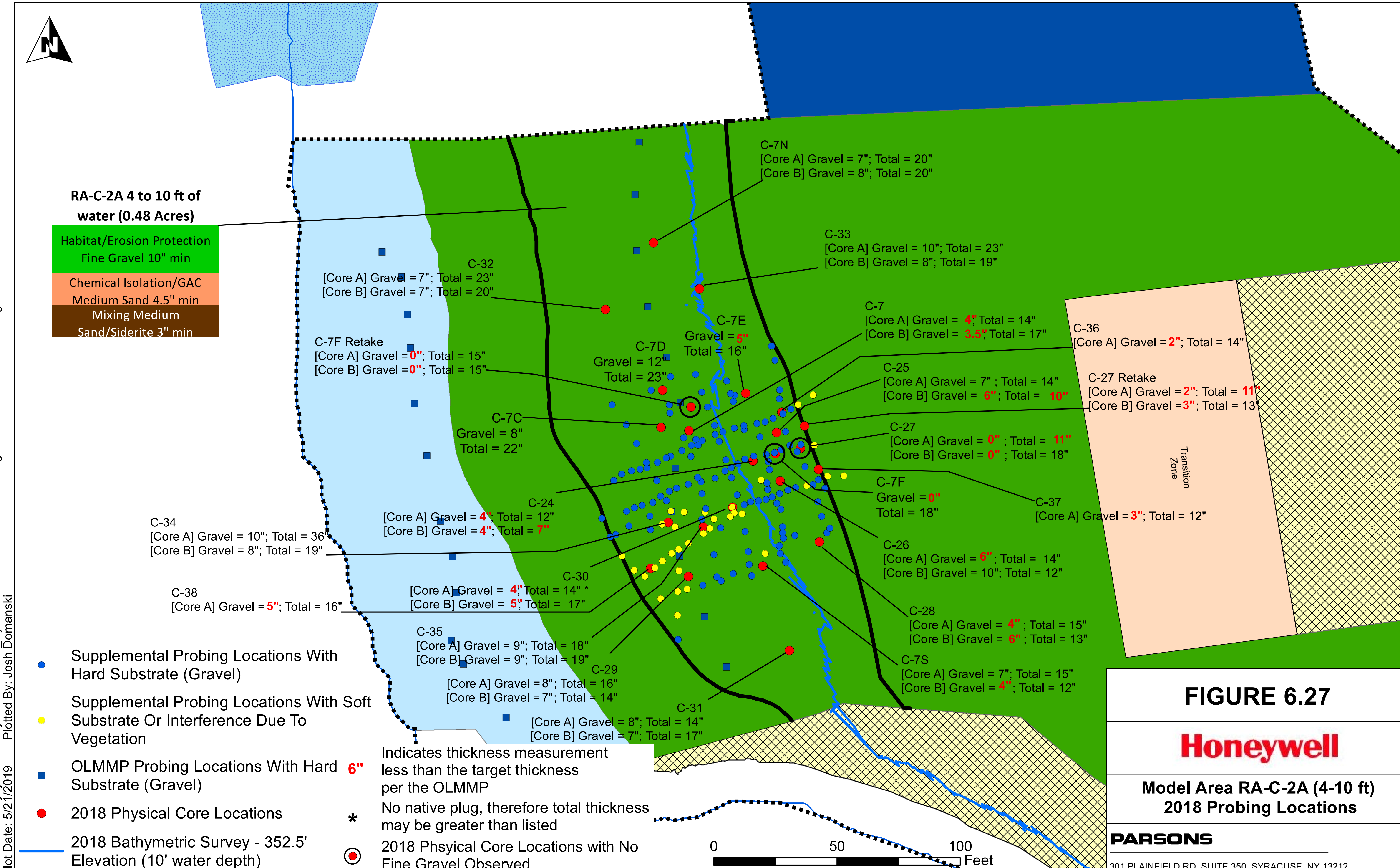


FIGURE 6.27

Model Area RA-C-2A (4-10 ft)
2018 Probing Locations

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\2019\Figure 6.27 RAC 2018 Probing.mxd
Plot Date: 5/21/2019 Plotted By: Josh Domanski

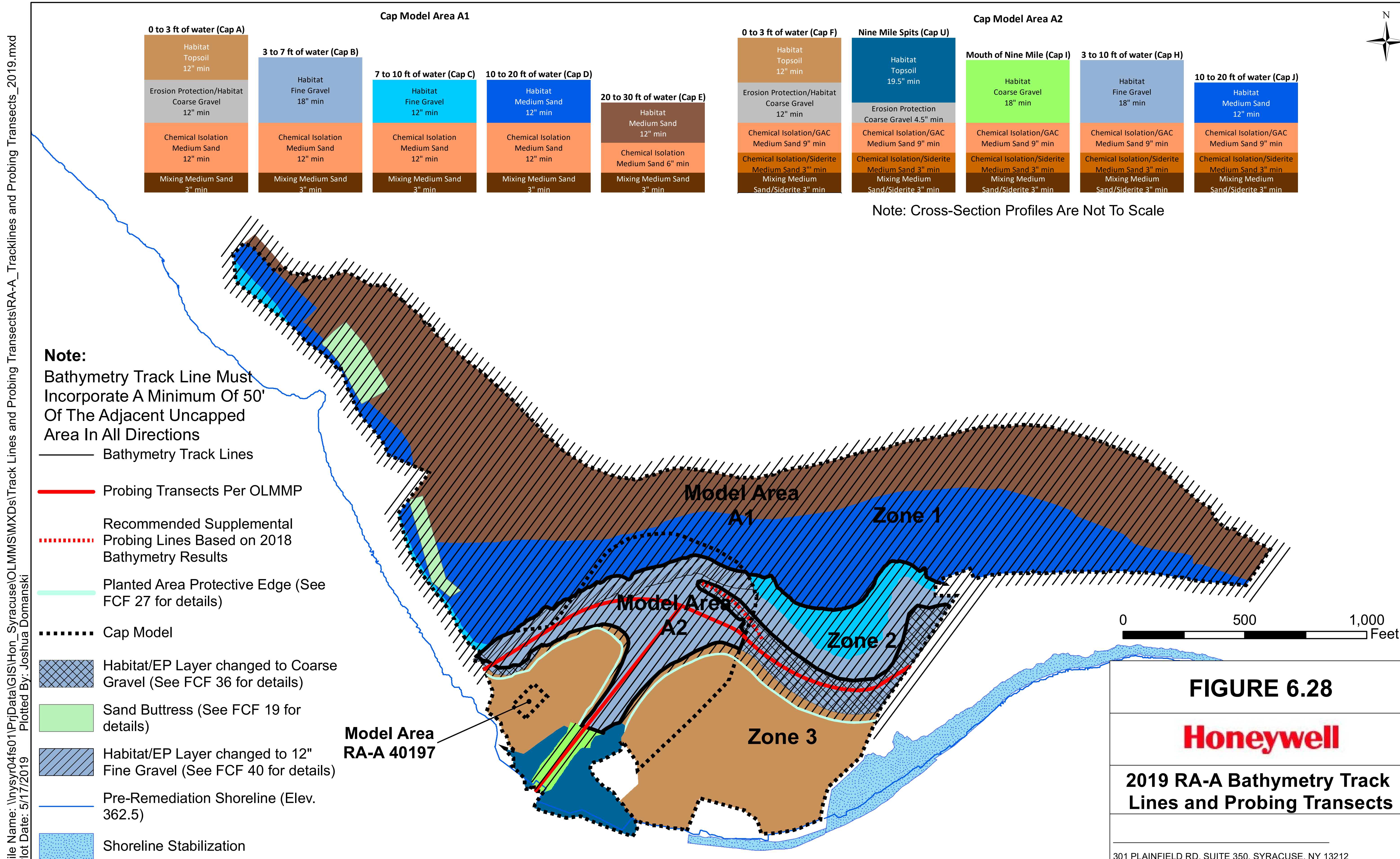


FIGURE 6.28

2019 RA-A Bathymetry Track Lines and Probing Transects

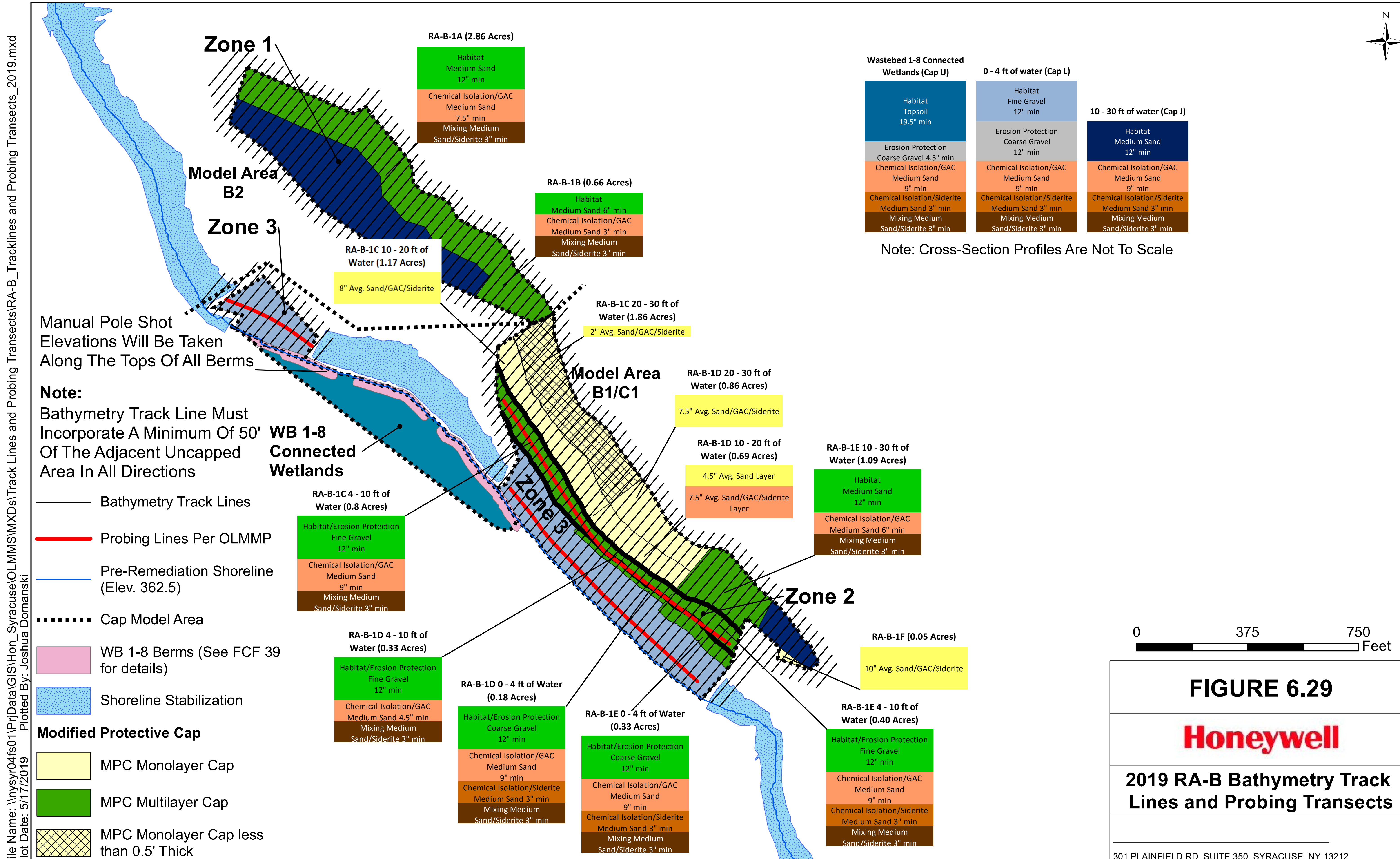


FIGURE 6.29

2019 RA-B Bathymetry Track Lines and Probing Transects

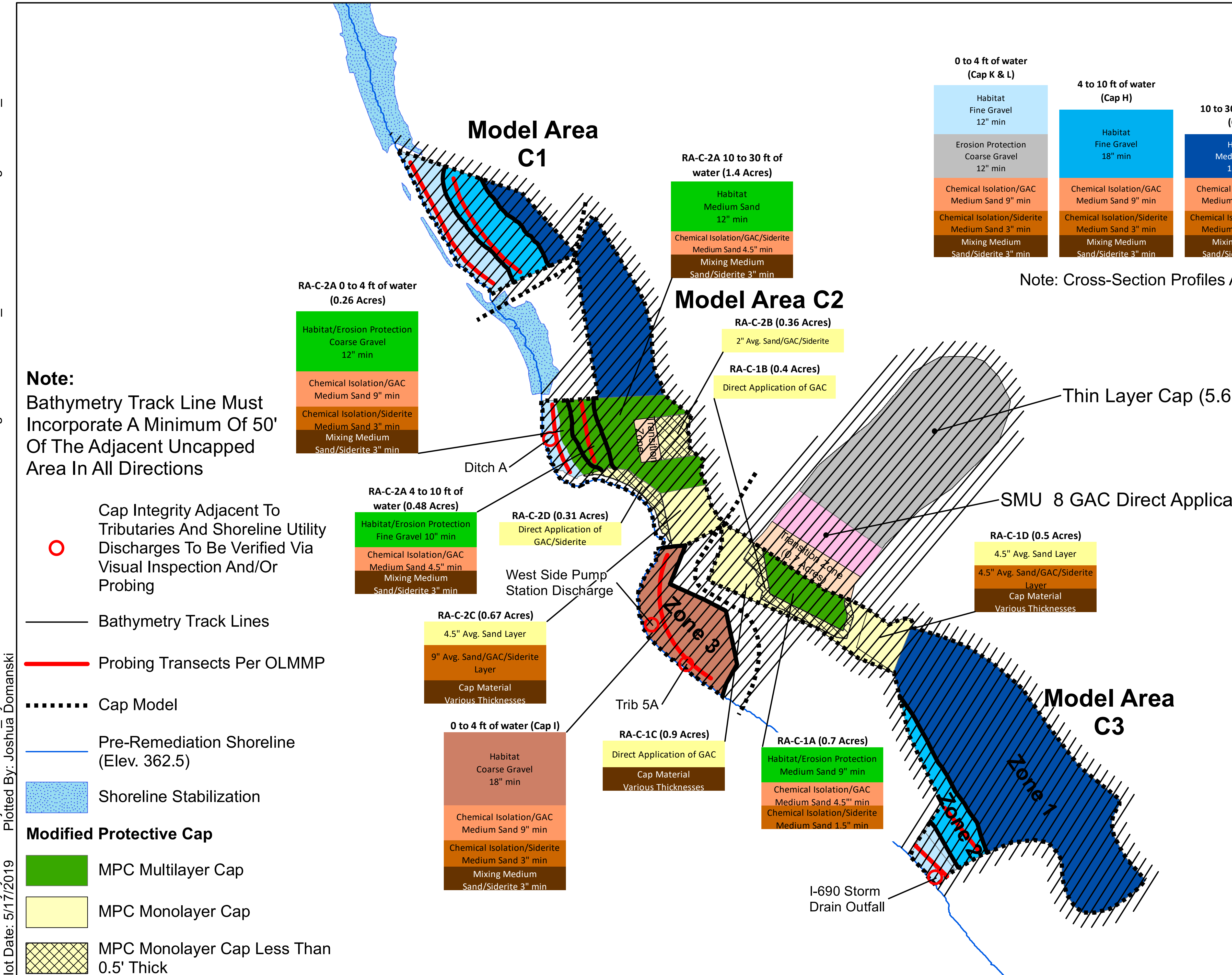


FIGURE 6.30

Honeywell

2019 RA-C Bathymetry Track Lines and Probing Transects

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\Track Lines and Probing Transects\RA-C_Tracklines and Probing Transects_2019.mxd
Plot Date: 5/17/2019 Plotted By: Joshua Domanski

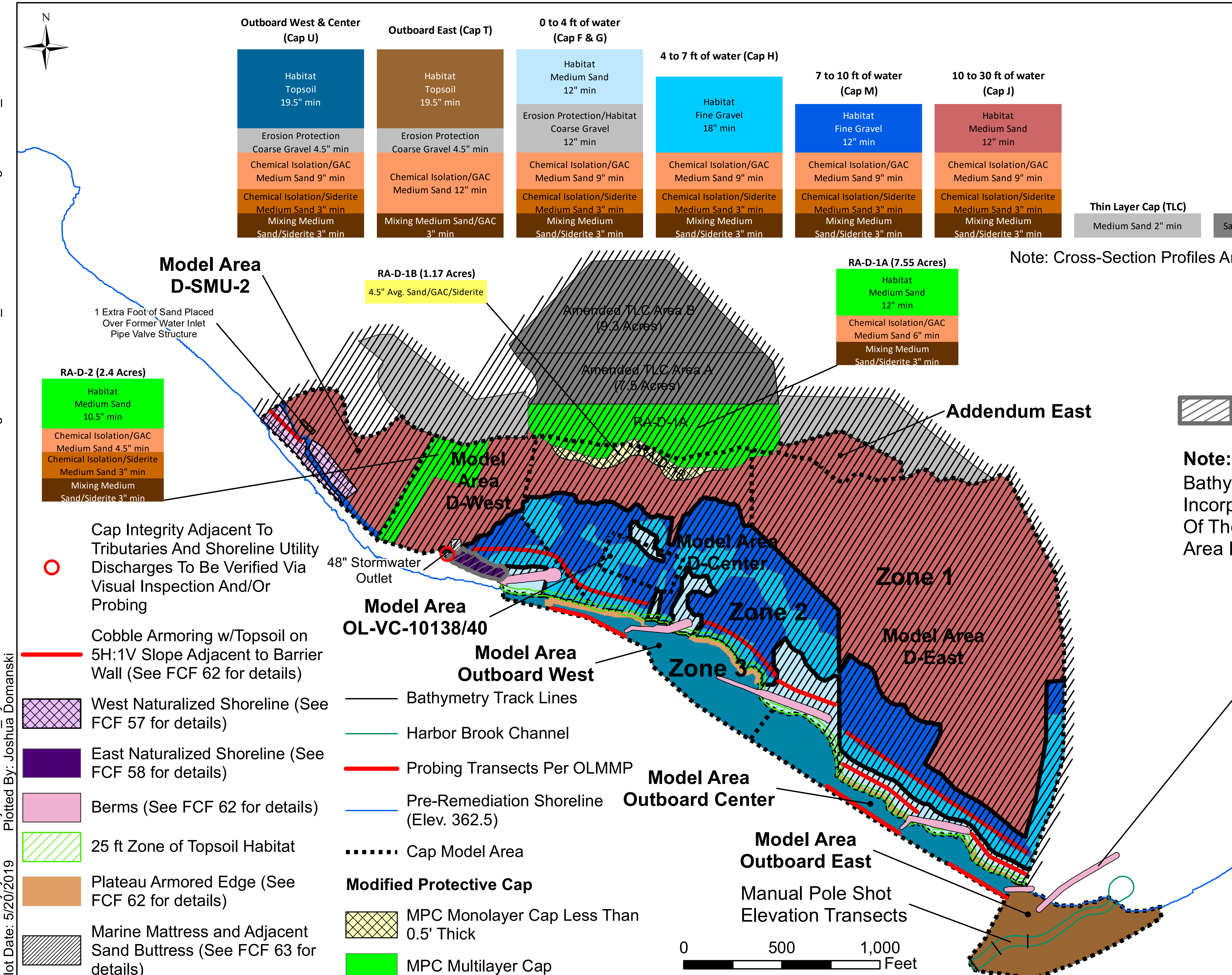


FIGURE 6.31

Honeywell

2019 RA-D Bathymetry Track Lines and Probing Transects

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\Track Lines and Probing Transects\RA-D_Tracklines and Probing Transects_2019.mxd
Plot Date: 5/20/2019 Plotted By: Joshua Domanski

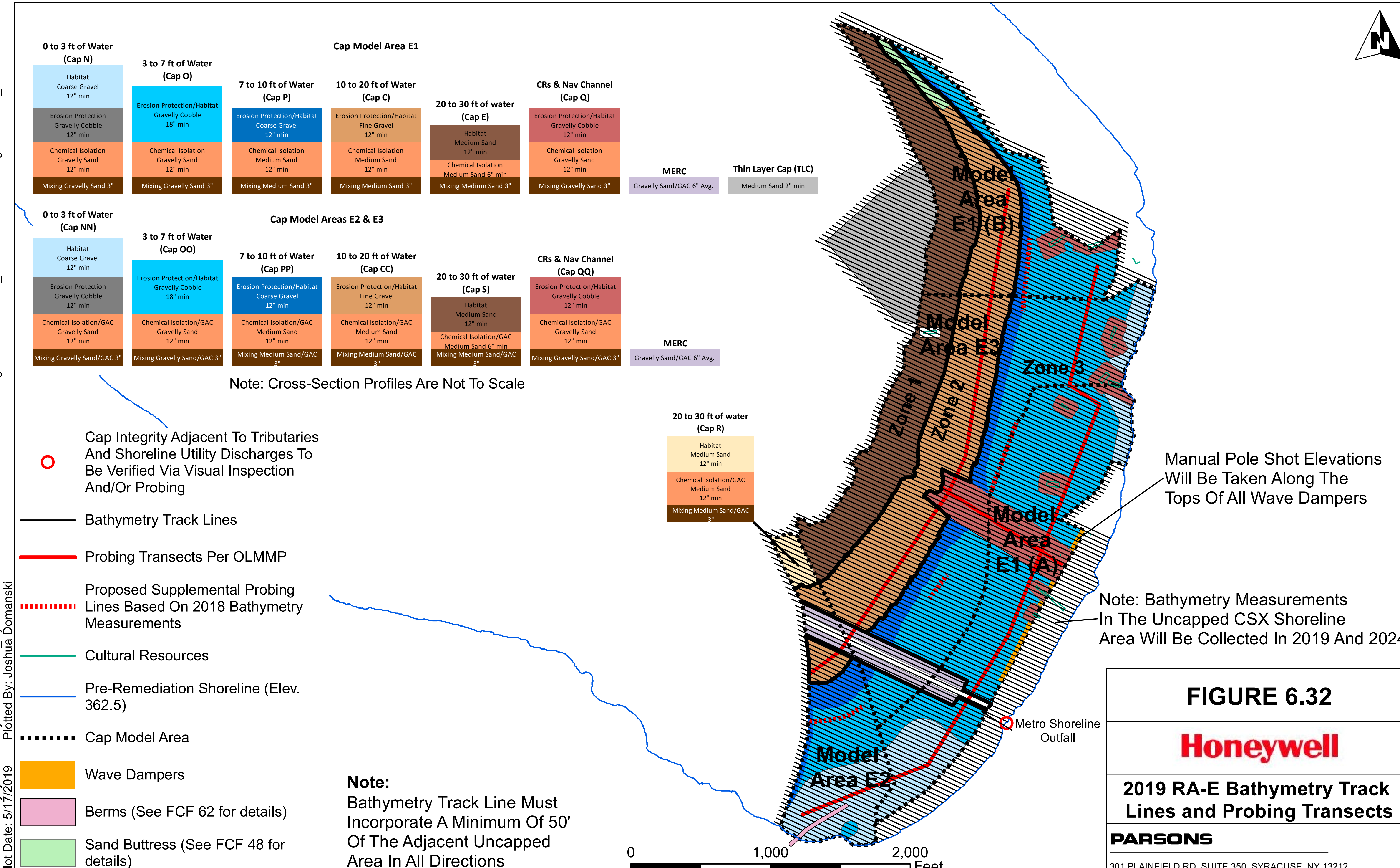
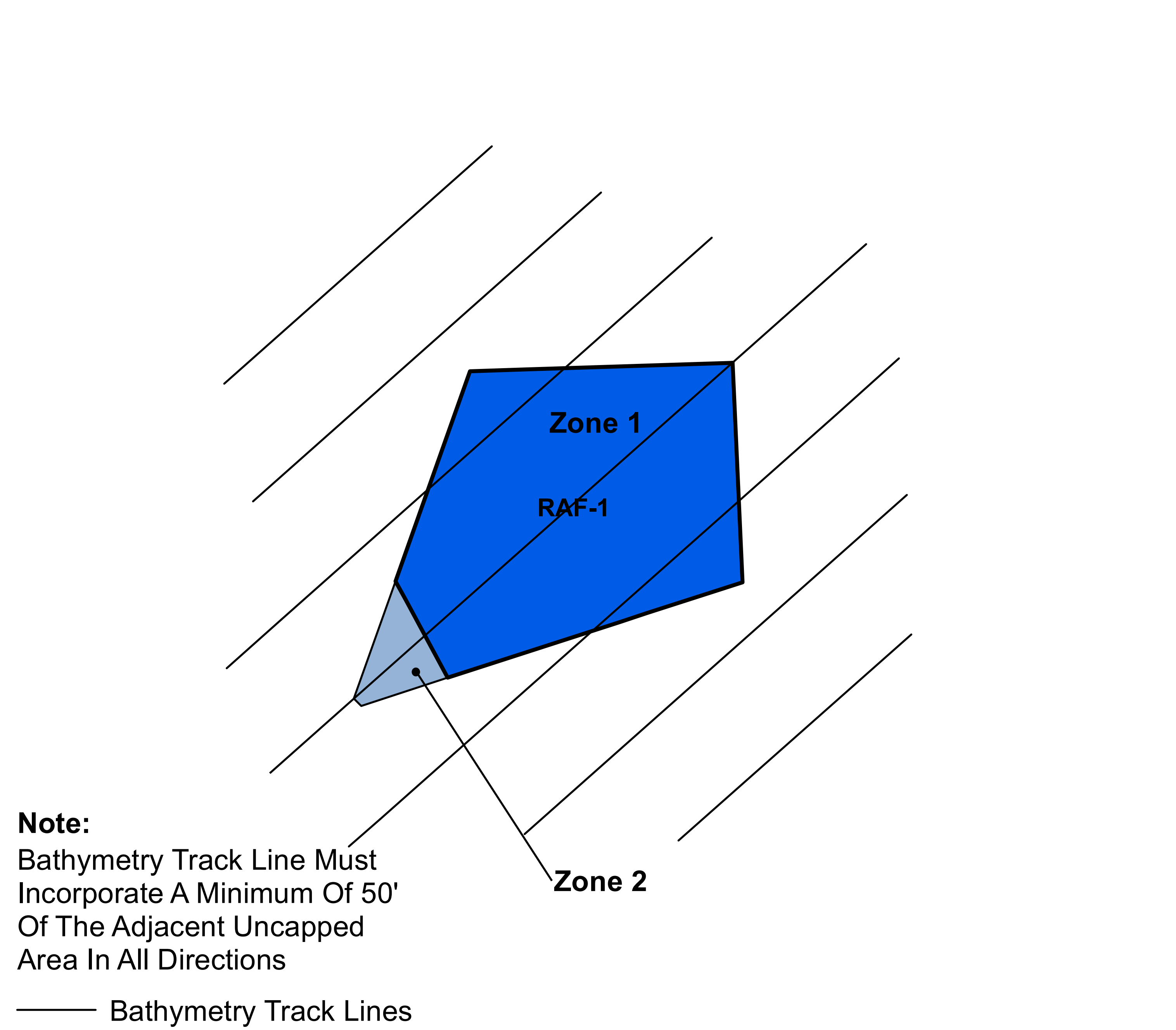
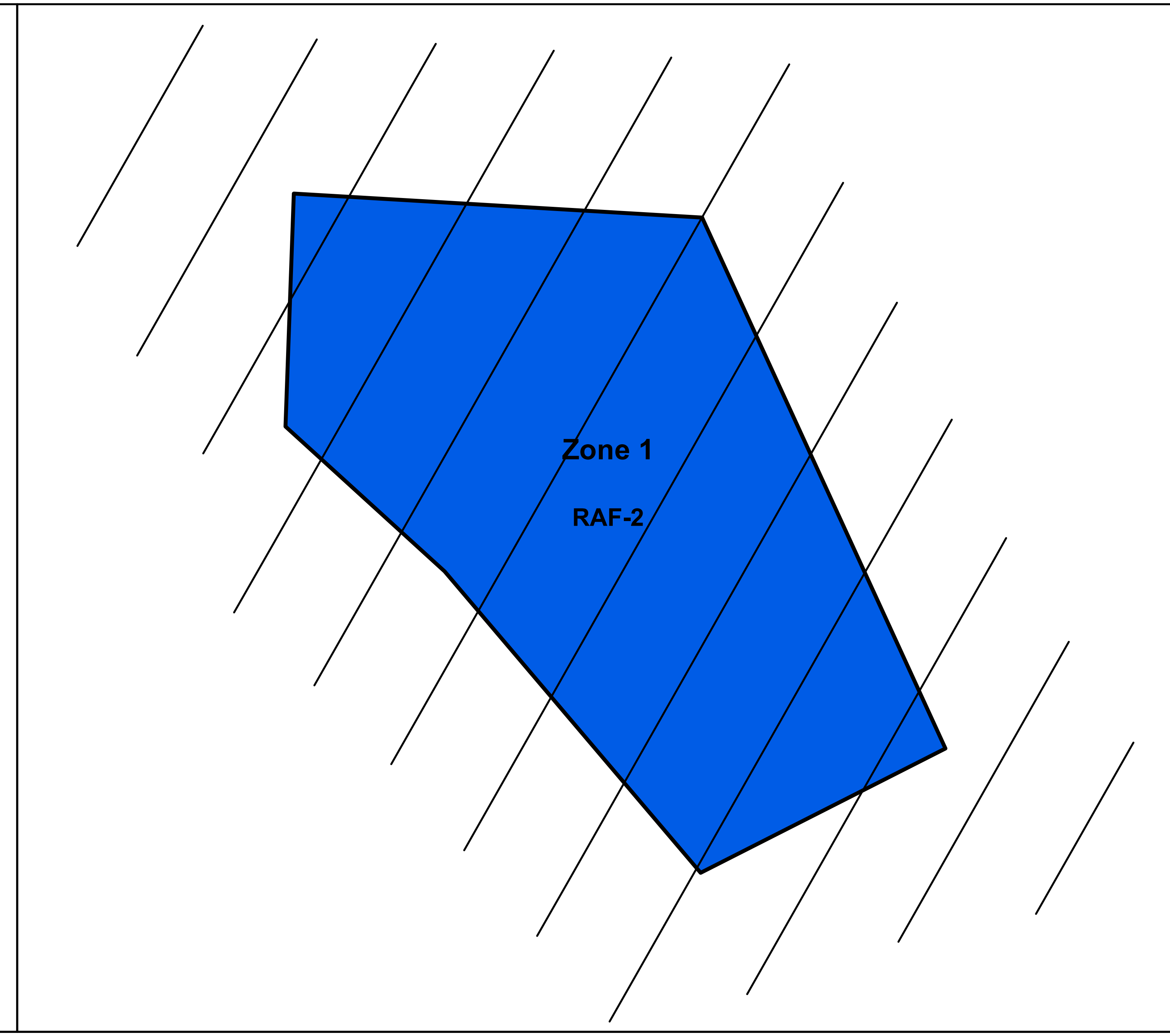


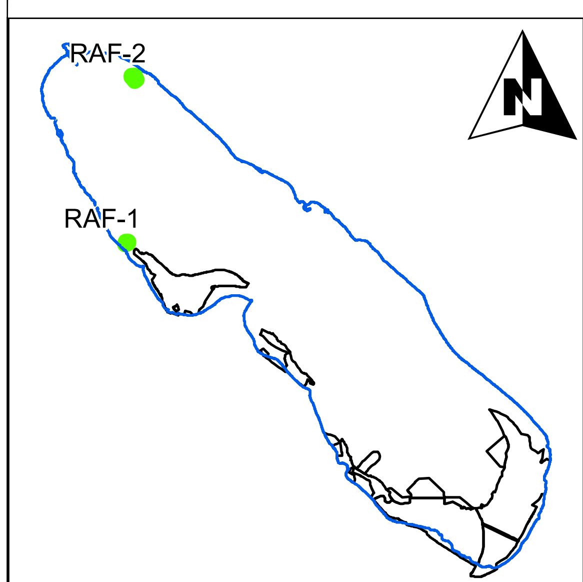
FIGURE 6.32

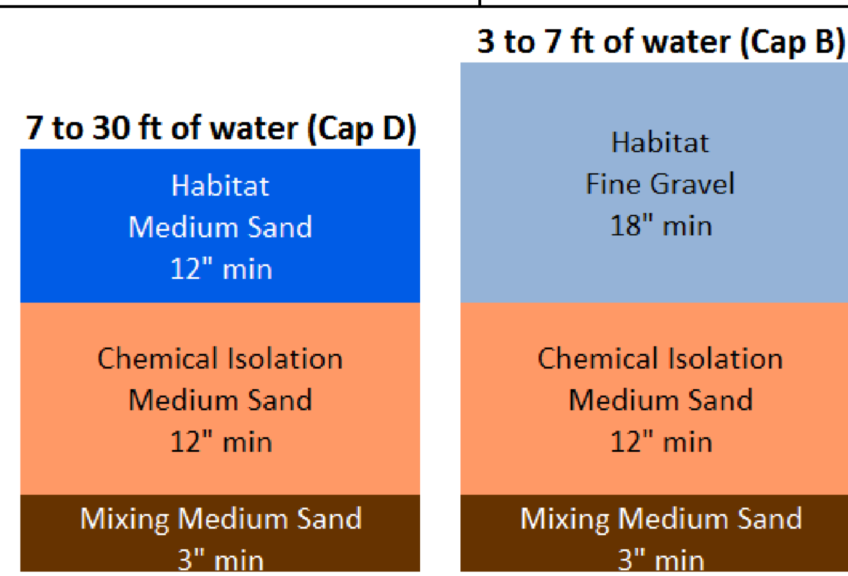
2019 RA-E Bathymetry Track Lines and Probing Transects

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\Track Lines and Probing Transects\RA-E_Tracklines and Probing Transects_2019.mxd
Plot Date: 5/17/2019 Plotted By: Joshua Domanski









Note: Cross-Section Profiles
Are Not To Scale

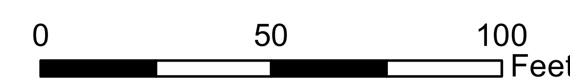


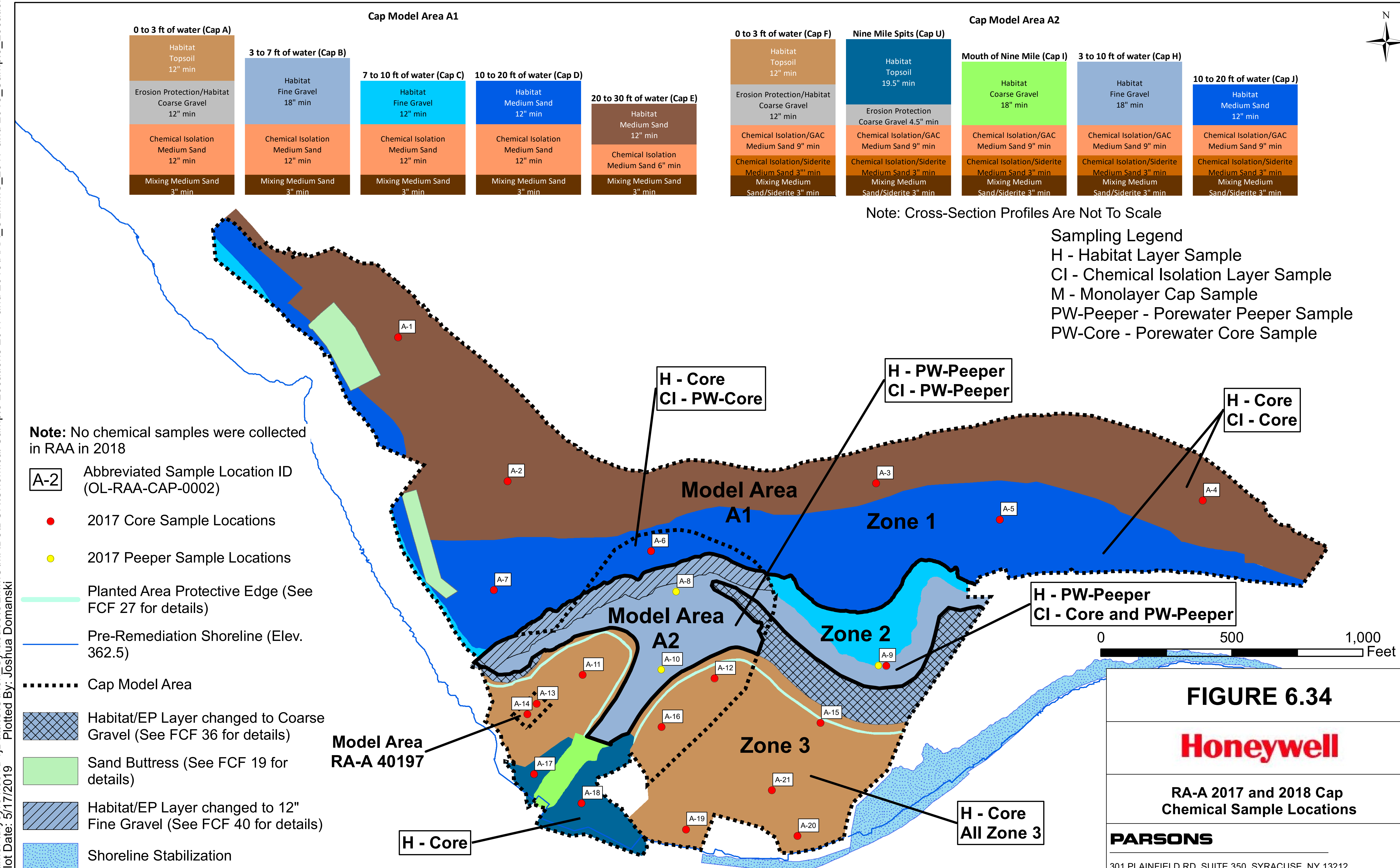
FIGURE 6.33

Honeywell

2019 RA-F Bathymetry Track Lines

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212



File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Chemical Sample Locations 2017 and 2018\RAA_OLMMS_2017 and 2018_Sample_Locations.mxd
Plot Date: 5/17/2019 Plotted By: Joshua Domanski

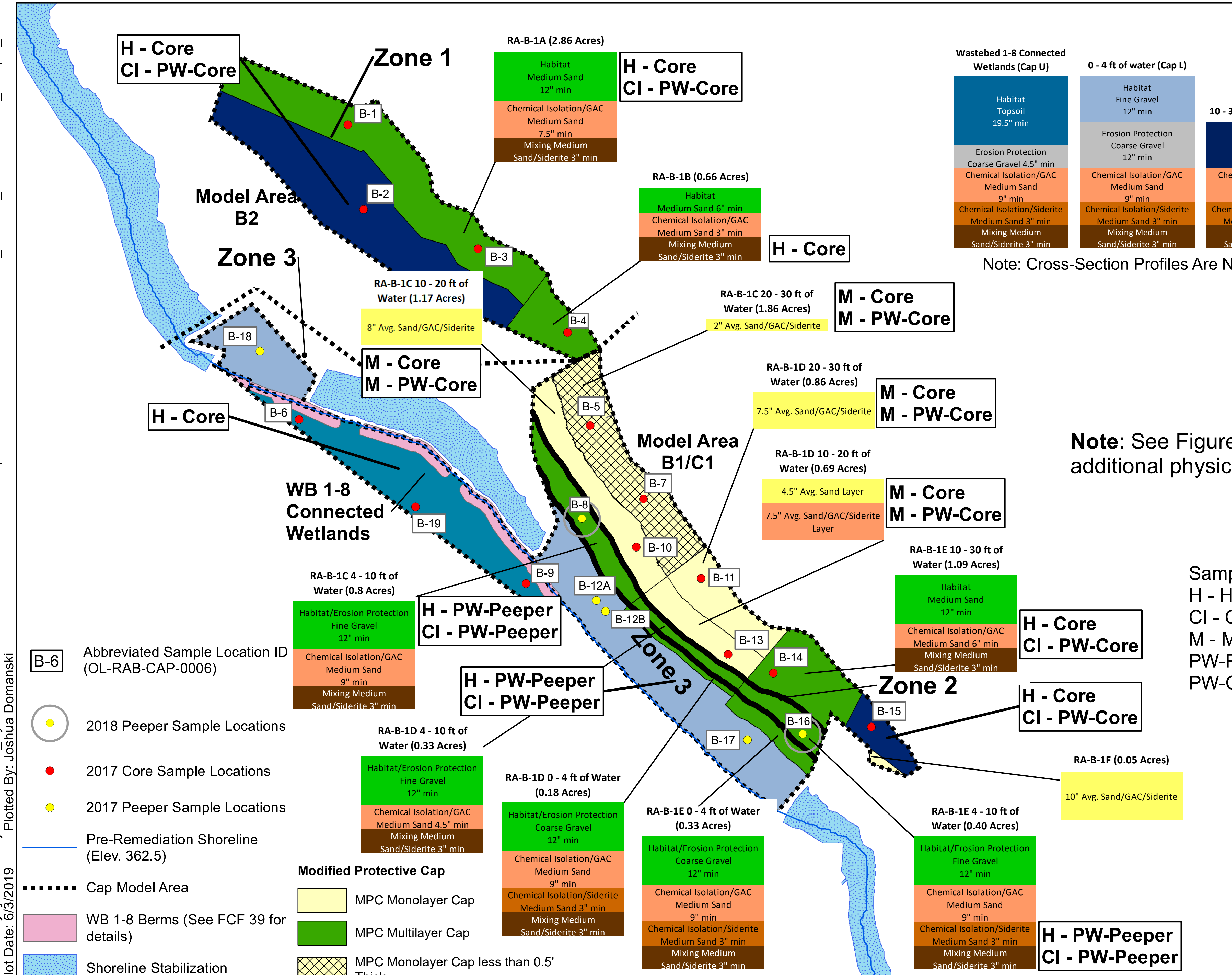


FIGURE 6.35

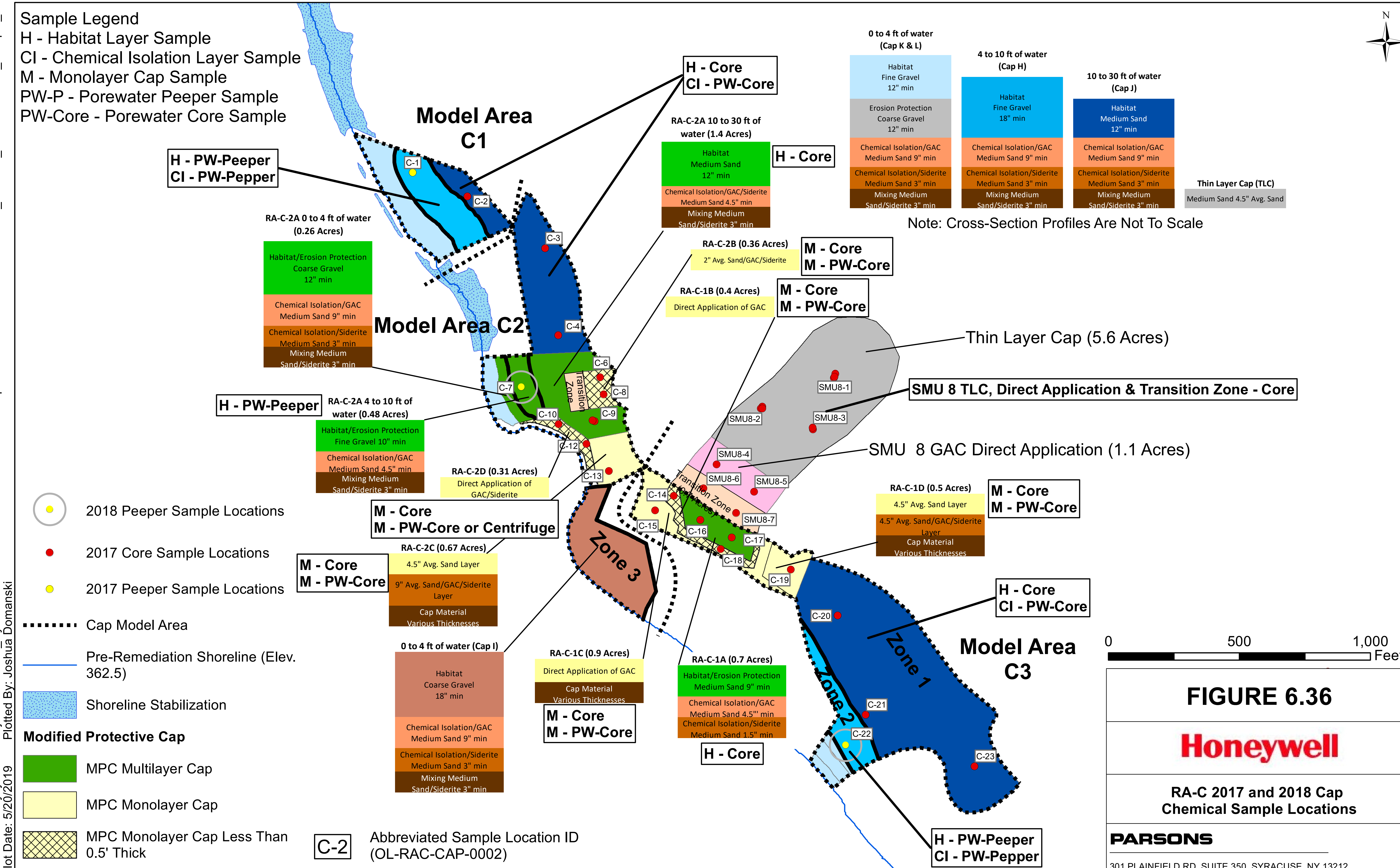
Honeywell

RA-B 2017 and 2018 Cap Chemical Sample Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Chemical Sample Locations 2017 and 2018\RAB_OLMMS_2017 and 2018_Sample_Locations.mxd
Plot Date: 6/3/2019 Plotted By: Joshua Domanski



File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Chemical Sample Locations 2017 and 2018\RAC_OLMMS_2017 and 2018_Sample_Locations.
Plot Date: 5/20/2019 Plotted By: Joshua Domanski

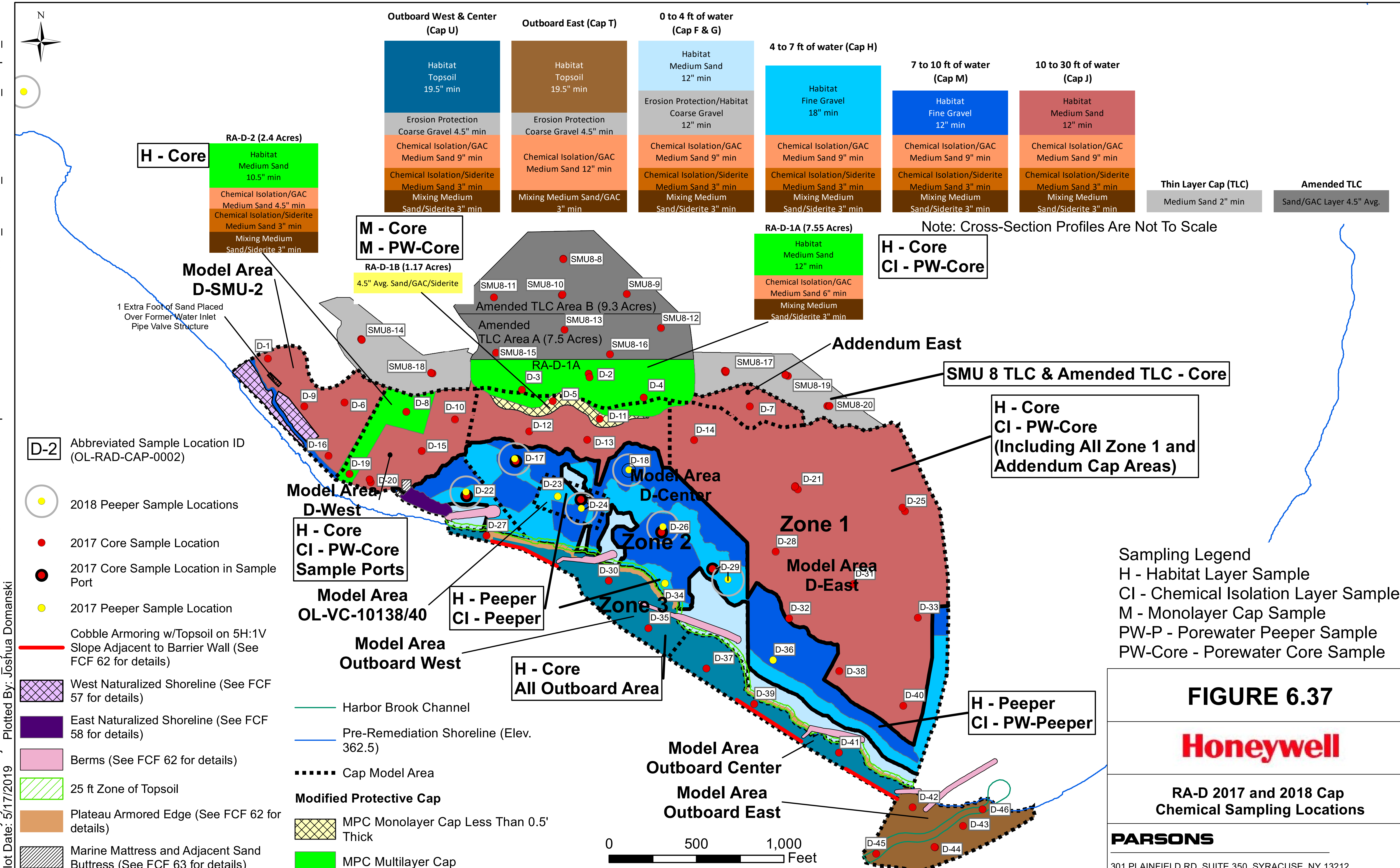


FIGURE 6.37

RA-D 2017 and 2018 Cap Chemical Sampling Locations

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Chemical Sample Locations 2017 and 2018\RAD_OLMMS_2017 and 2018_Sample_Locations.mxd
Plot Date: 5/17/2019 Plotted By: Joshua Domanski

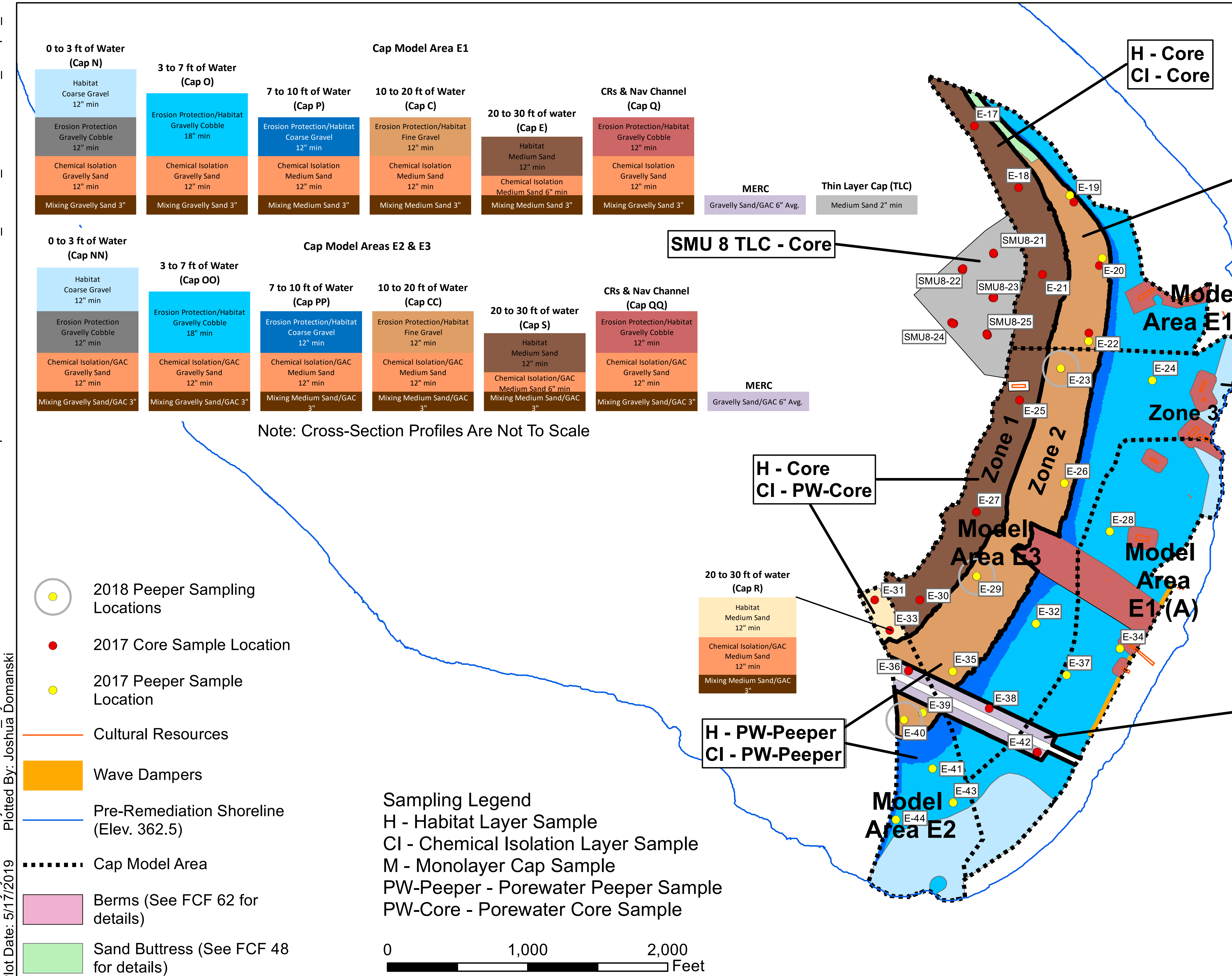


FIGURE 6.38

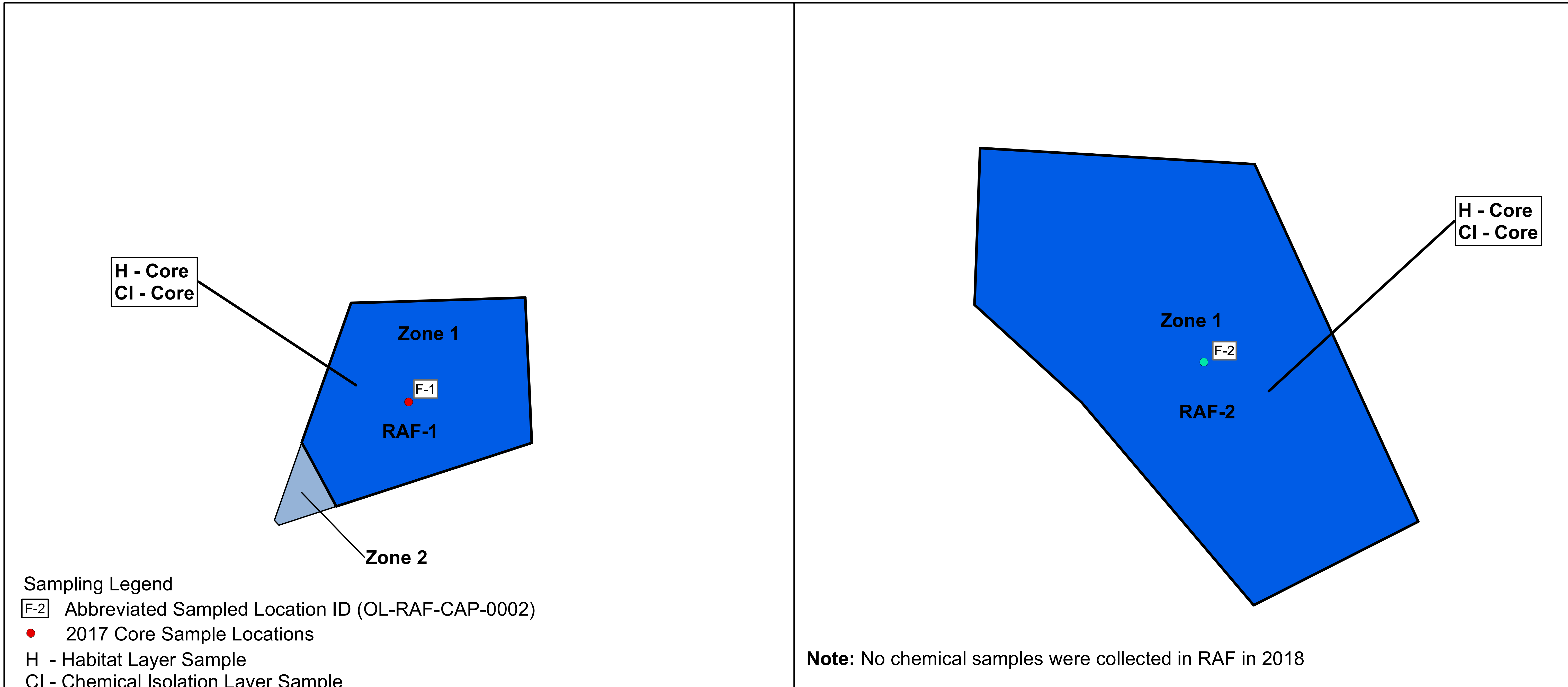
Honeywell

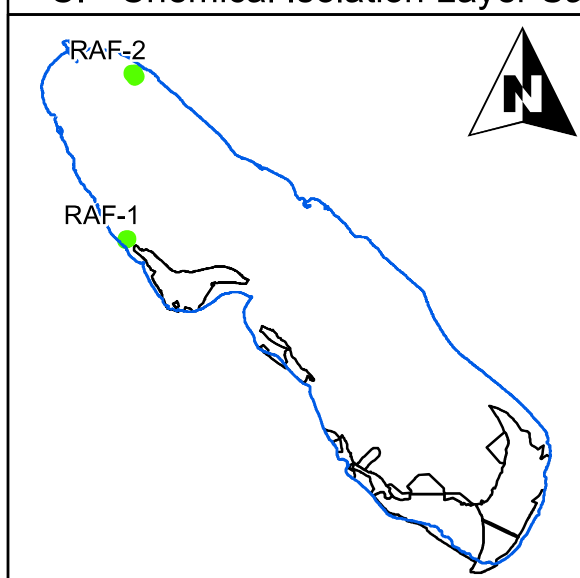
RA-E 2017 and 2018 Cap Chemical Sample Locations

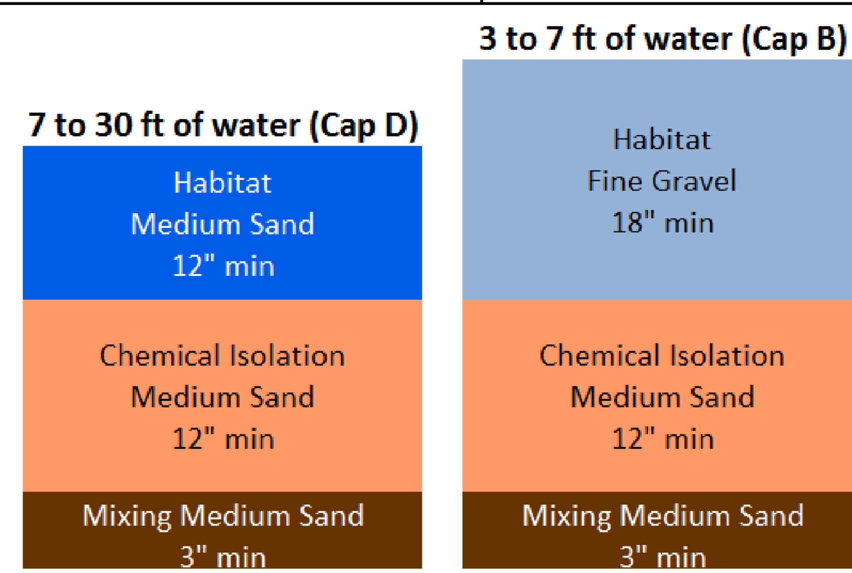
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PriData\GIS\Hon_Syracuse\OLMMS\MXDs\DSR\Chemical Sample Locations 2017 and 2018\RAE_OLMMS_2017 and 2018_Sample_Locations.mxd
Plot Date: 5/17/2019 Plotted By: Joshua Domanski







Note: Cross-Section Profiles Are Not To Scale

0 50 100 Feet

FIGURE 6.39

Honeywell

RA-F 2017 and 2018 Cap Chemical Sample Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

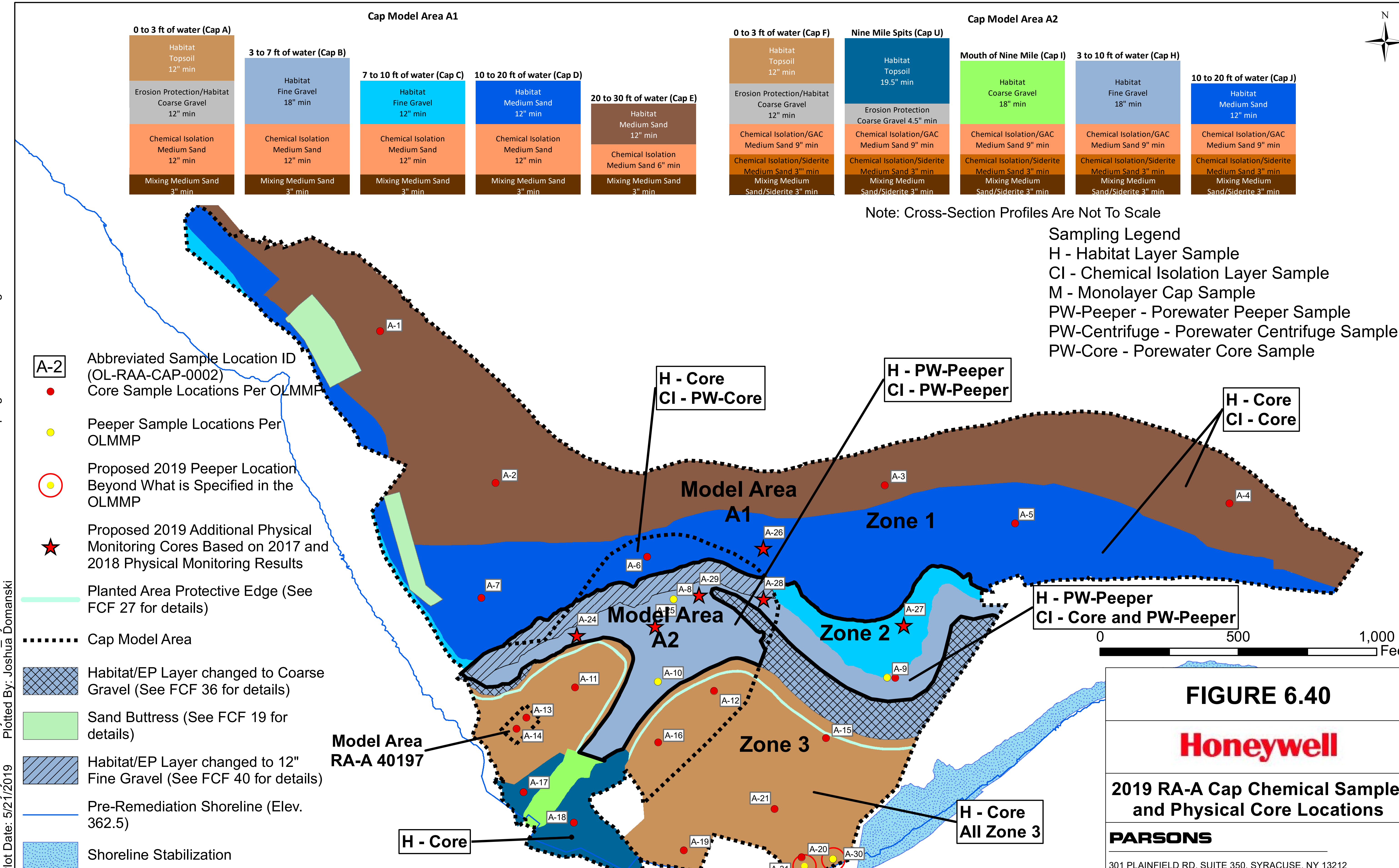


FIGURE 6.40

Honeywell

2019 RA-A Cap Chemical Sample and Physical Core Locations

PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\Chemical Sampling Locations\RAA Figure 6.40.mxd
Plot Date: 5/21/2019 Plotted By: Joshua Domanski

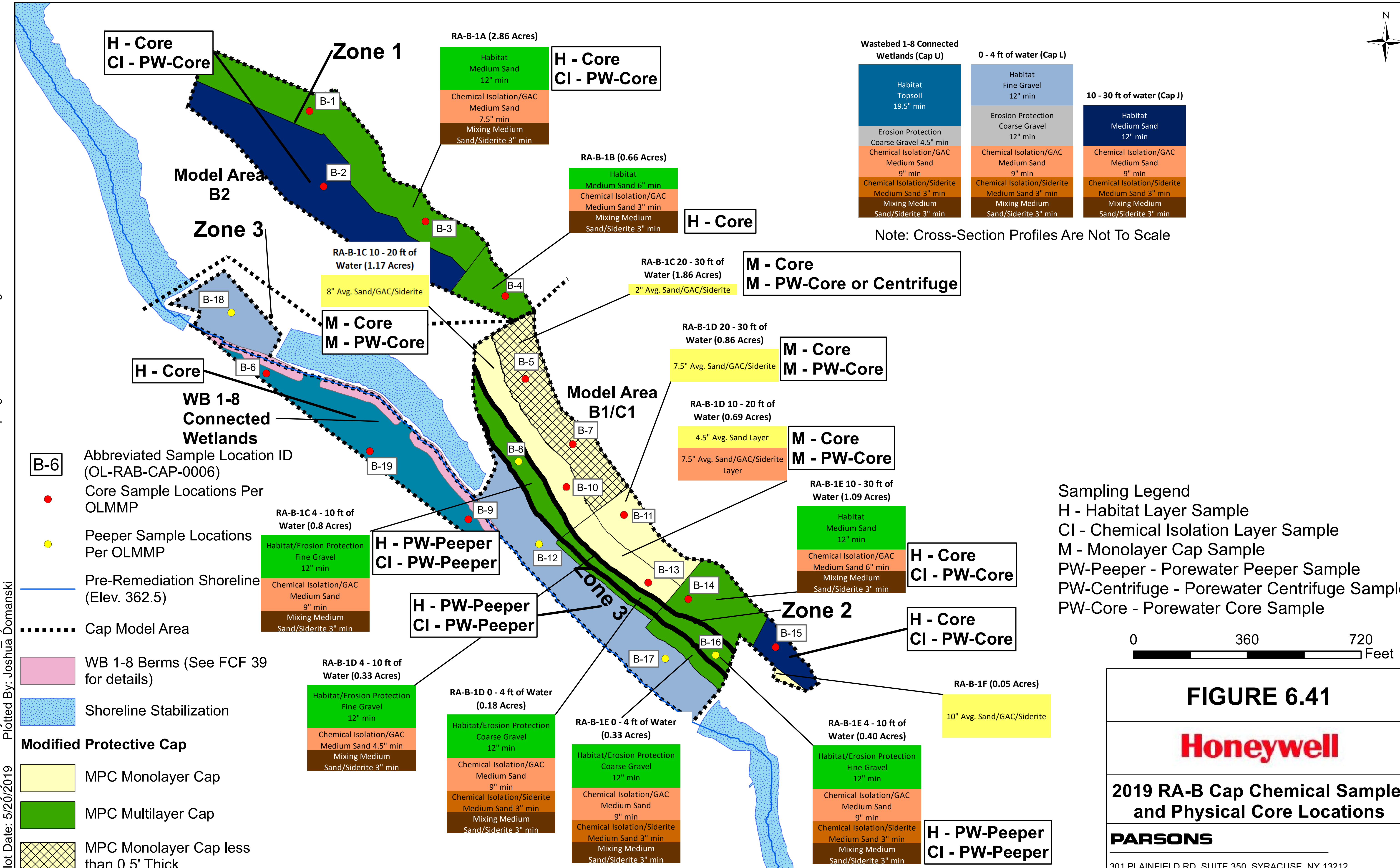


FIGURE 6.41

Honeywell

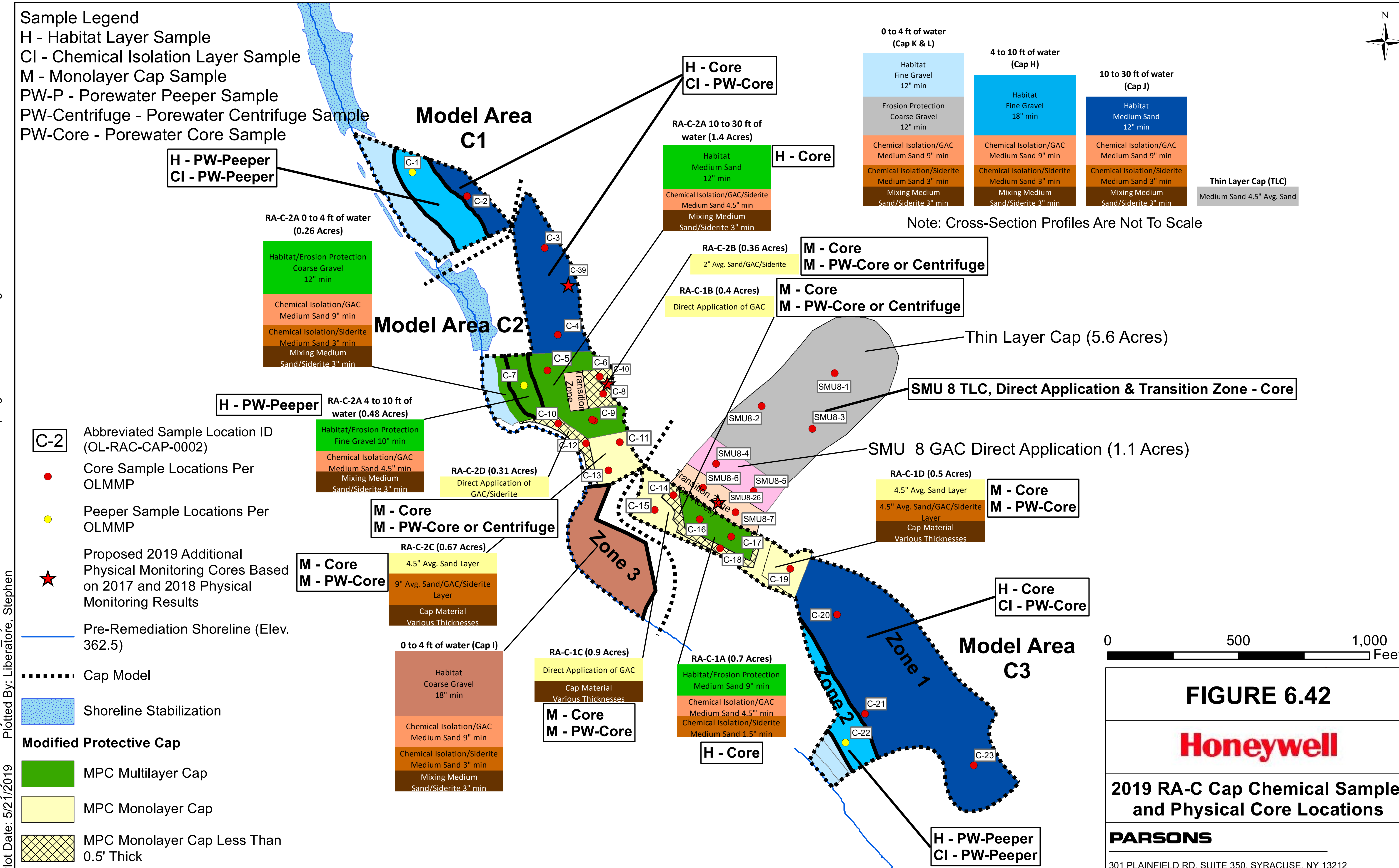
2019 RA-B Cap Chemical Sample and Physical Core Locations

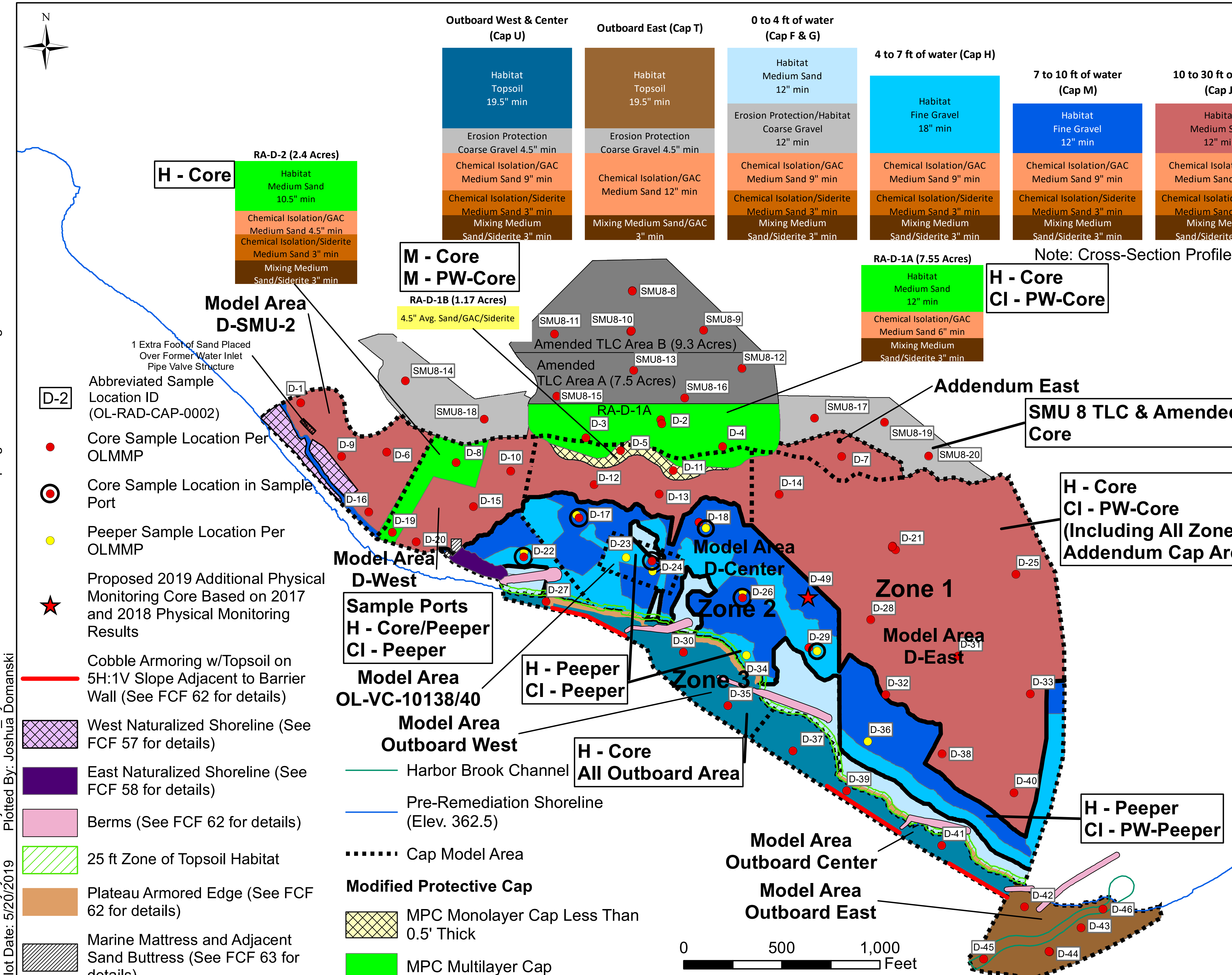
PARSONS

301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\Chemical Sampling Locations\RAB Figure 6.41.mxd
Plot Date: 5/20/2019 Plotted By: Joshua Domanski

File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\Chemical Sampling Locations\RAC Figure 6.42.mxd
Plotted By: Liberatore, Stephen
Plot Date: 5/21/2019





Summary of Sample Port Collection

Location	Habitat/Erosion Protection		Chemical Isolation	
	Core[1]	Peeper	Core	Peeper
D-17	X	X		X
D-18	X	X		X
D-22	X	X		X
D-24	X	X		X
D-26	X	X		X
D-29	X	X		X

[1] Solid phase samples collected for upper compliance sample only

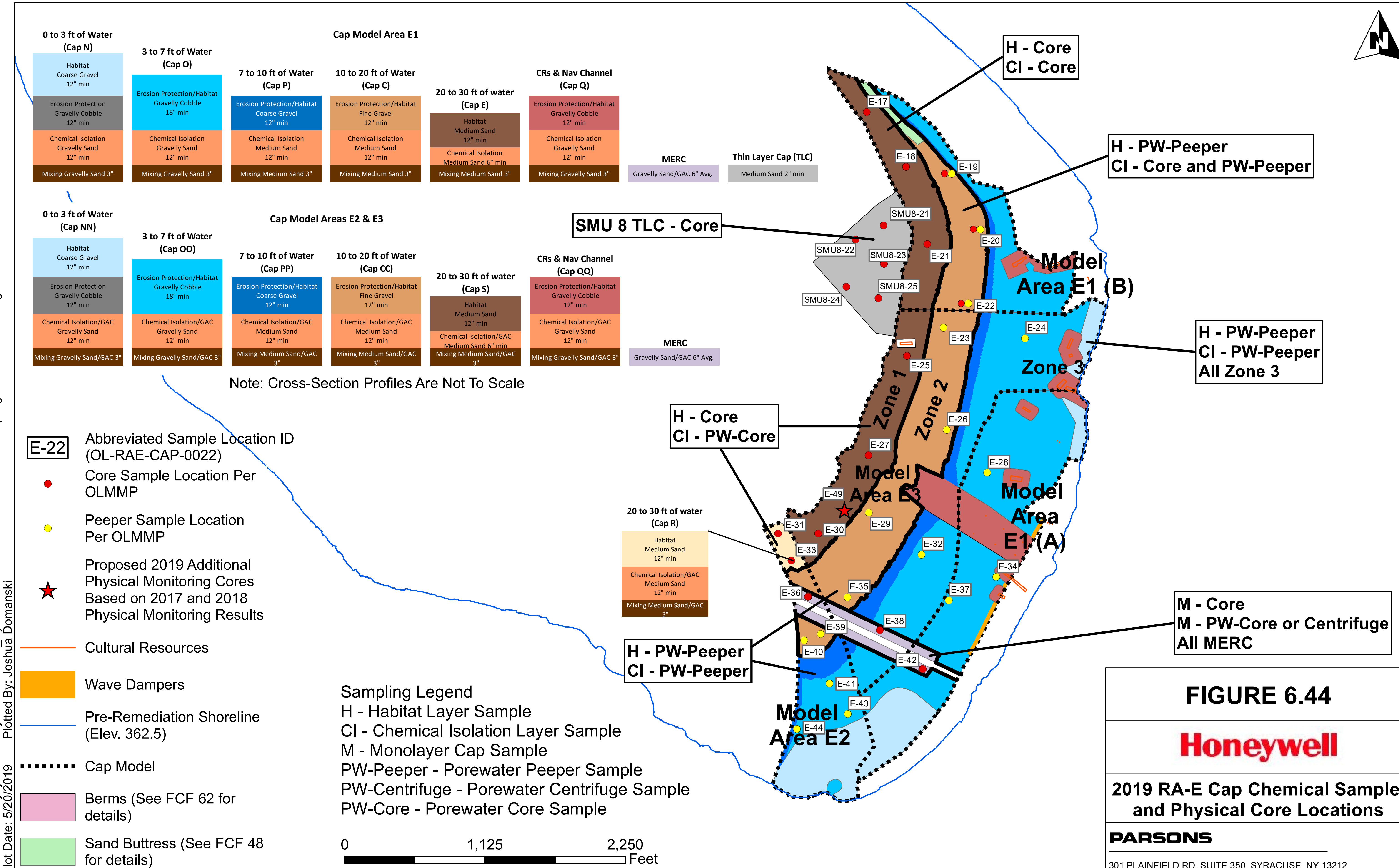
FIGURE 6.43

Honeywell

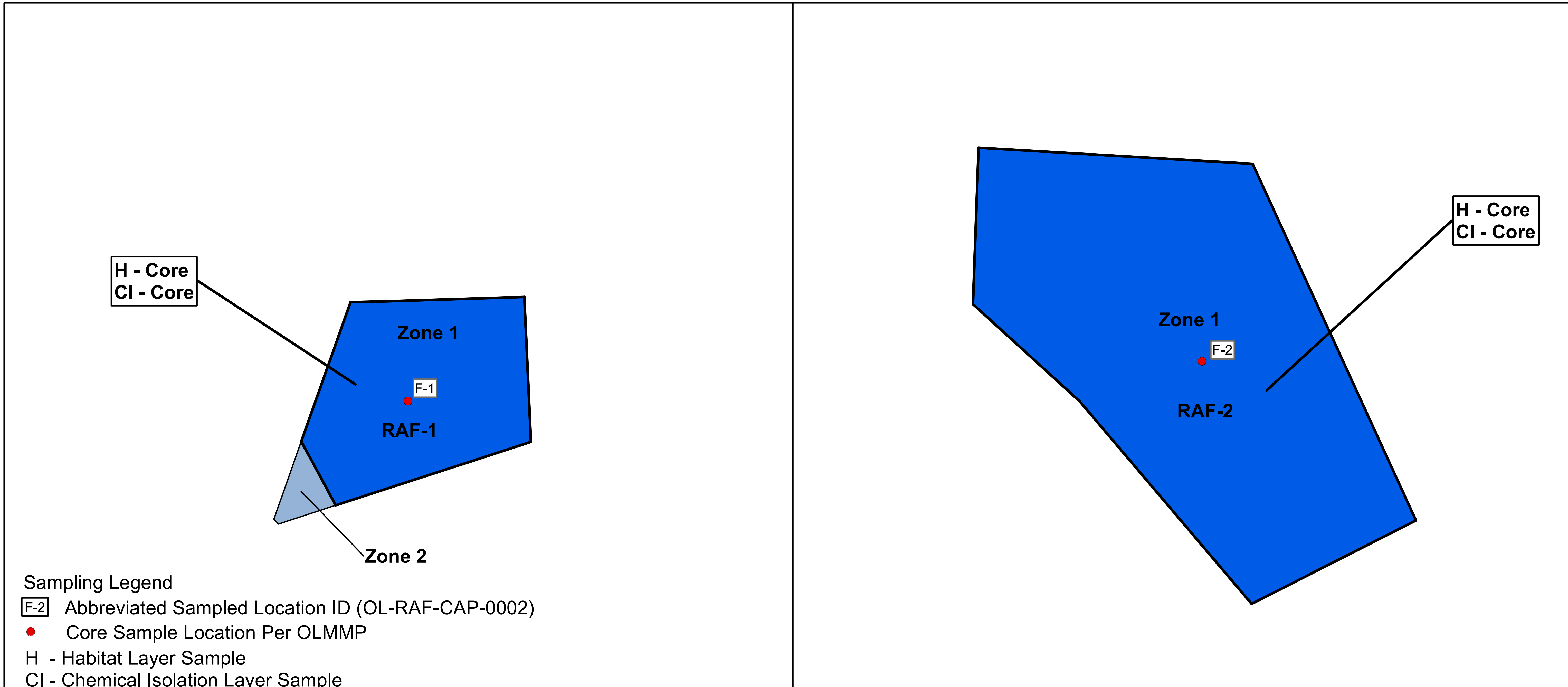
2019 RA-D Cap Chemical Sampling and Physical Core Locations

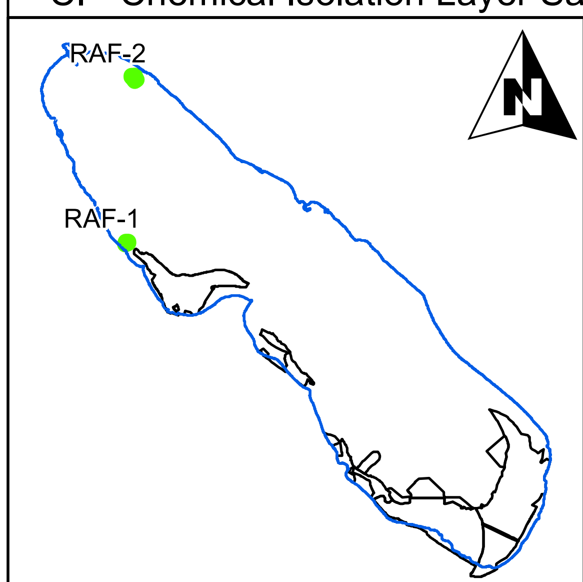
PARSONS

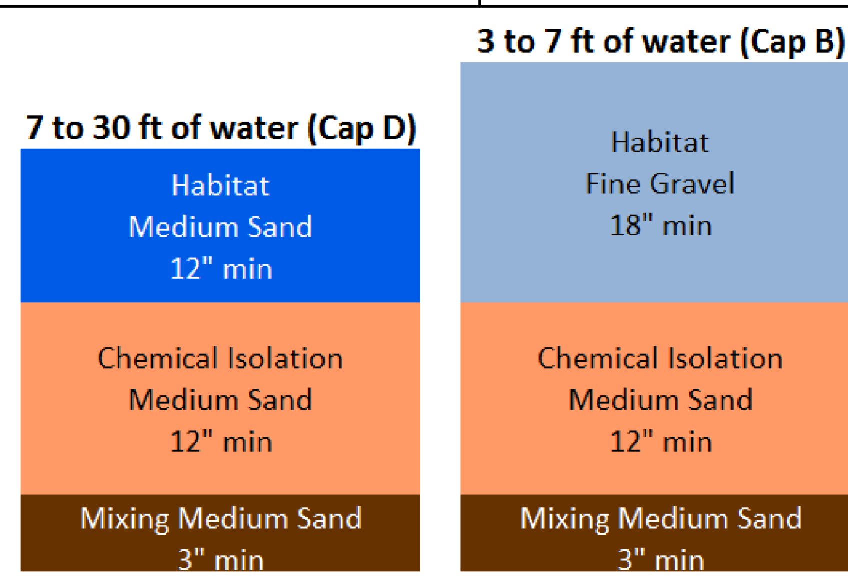
301 PLAINFIELD RD, SUITE 350, SYRACUSE, NY 13212



File Name: \\nysyr04fs01\PrjData\GIS\Hon_Syracuse\OLMMS\MXDs\Chemical Sampling Locations\RAE Figure 6.44.mxd
Plot Date: 5/20/2019 Plotted By: Joshua Domanski







Note: Cross-Section Profiles Are Not To Scale

0 50 100 Feet

FIGURE 6.45

Honeywell

2019 RA-F Cap Chemical Sample and Physical Core Locations

PARSONS

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X – Porewater Sample Interval–3 inches

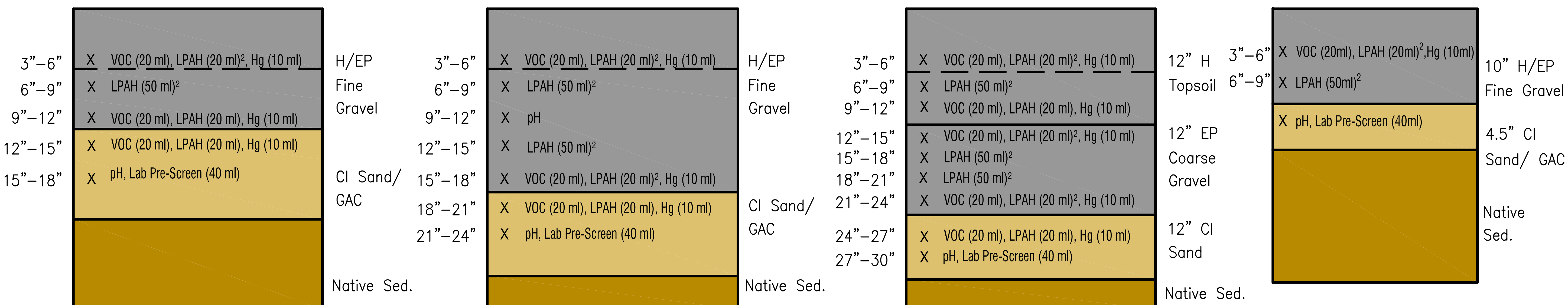
NOTE:
MEMBRANES WILL BE PLACED ON AT LEAST ONE INTERVAL BELOW THE LOWEST INTERVALS SHOWN. THESE INTERVALS COULD BE SAMPLED, SUBJECT TO NYSDEC APPROVAL, IN THE EVENT OF DAMAGE TO MEMBRANES IN THE INTERVALS DESIGNATED FOR SAMPLING AND/OR OTHER REASONS.

OL–RAB–CAP–0008
OL–RAB–CAP–0012
OL–RAB–CAP–0016
OL–RAB–CAP–0017
OL–RAB–CAP–0018
OL–RAD–CAP–0017
OL–RAD–CAP–0018
OL–RAD–CAP–0024
OL–RAD–CAP–0026
OL–RAD–CAP–0036
OL–RAE–CAP–0019[1]
OL–RAE–CAP–0020[1]
OL–RAE–CAP–0022[1]
OL–RAE–CAP–0023
OL–RAE–CAP–0026
OL–RAE–CAP–0029
OL–RAE–CAP–0035
OL–RAE–CAP–0039
OL–RAE–CAP–0040

OL–RAA–CAP–0008
OL–RAA–CAP–0010
OL–RAA–CAP–0009[1]
OL–RAC–CAP–0001
OL–RAC–CAP–0022
OL–RAD–CAP–0022
OL–RAD–CAP–0023
OL–RAD–CAP–0029
OL–RAD–CAP–0034
OL–RAE–CAP–0024
OL–RAE–CAP–0028
OL–RAE–CAP–0032
OL–RAE–CAP–0034
OL–RAE–CAP–0037
OL–RAE–CAP–0041
OL–RAE–CAP–0043
OL–RAE–CAP–0044

OL–RAA–CAP–0030
OL–RAA–CAP–0031

OL–RAC–CAP–0007[3]



1. Unamended CI layer, therefore solid phase samples will also be collected from the CI layer, pH analysis not required.
2. Combine at the lab following VOC analysis for a total LPAH sample volume of 70 ml.
3. If core data indicate sufficient additional material beyond what is shown in the schematic, additional sample(s) may be collected.

FIGURE 6.46

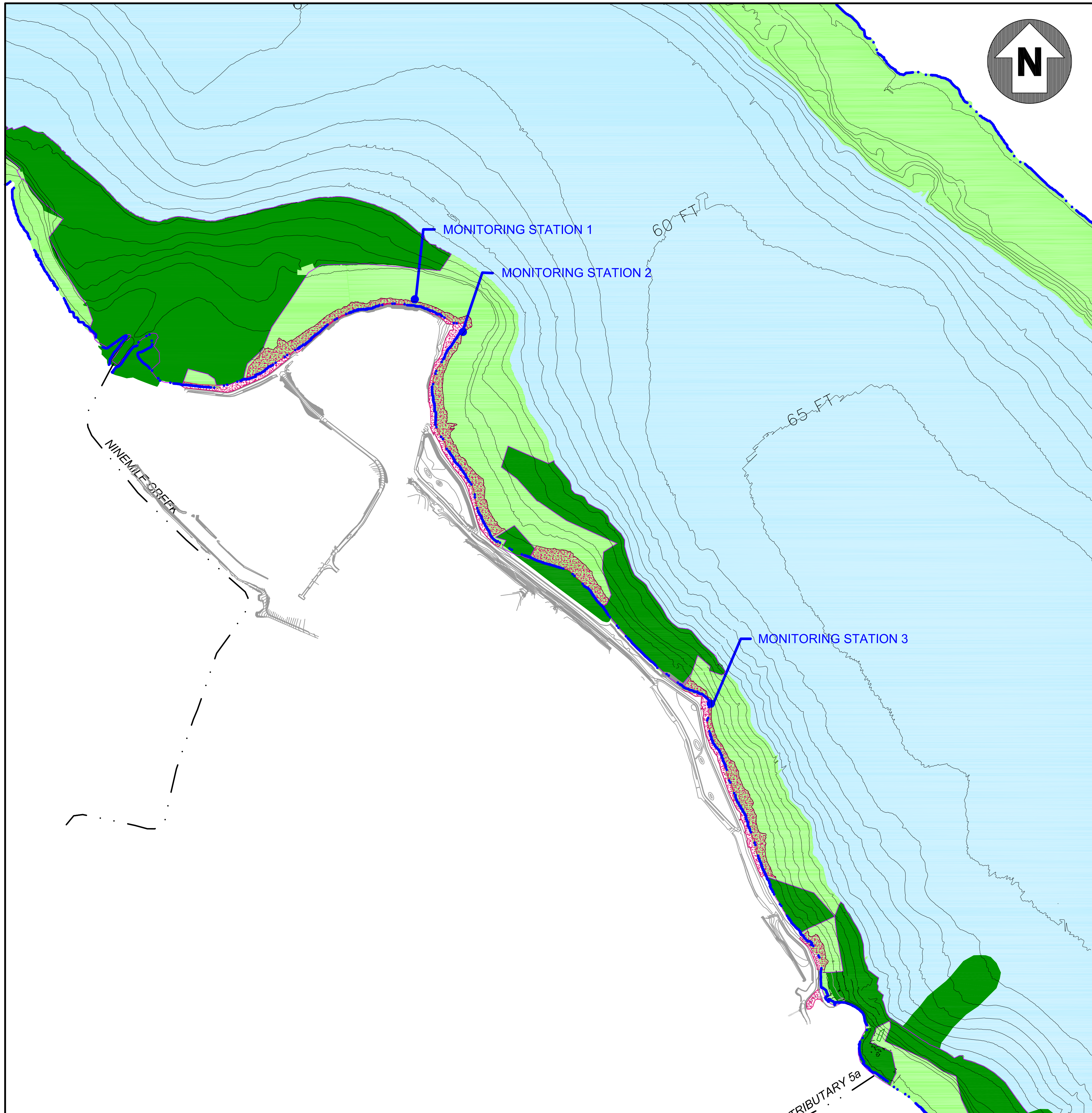
Honeywell

ONONDAGA LAKE
SYRACUSE, NY

PEEPER POREWATER SAMPLING SCHEMATICS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL -SYR\446232 – CAP DESIGN\10 TECHNICAL CATEGORIES\10.1 CAD\FINAL TO DEC\446232-FIGURE D.19_REV1.DWG
PLOT DATE: 5/20/2019 3:35 PM PLOTTED BY: DOMANSKI, JOSHUA



LEGEND:

SHORELINE STABILIZATION

MONITORING STATION

REMEDIATION AREA BOUNDARY

SMU BOUNDARY

CAPPED AREAS (INCLUDES ALL ISOLATION, THIN LAYER, AND MODIFIED PROTECTIVE CAPS)

SMU 8

LITTORAL ZONE

NOTES:

1. WATER DEPTH CONTOUR INTERVAL IS 5 FT (POST–REMEDIATION).
2. THE 30' WATER DEPTH CONTOUR IS THE BOUNDARY BETWEEN THE LITTORAL ZONE (SMUs 1–7) AND SMU 8.

1000 500 0 1000 2000

SCALE: 1"=1000'

FIGURE 7.1

Honeywell

ONONDAGA LAKE
SYRACUSE, NEW YORK

2017 TURBIDITY MONITORING STATIONS ALONG WASTEBEDS 1–8 SHORELINE

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212, PHONE: 315–451–9560

FILE NAME: P:\HONEYWELL -SYR\450102 - 2016 OL REMEDIAL GOAL MONITORING\10 TECHNICAL CATEGORIES\CAD\2017\450102-MNR-2017-05.DWG
PLOT DATE: 6/14/2019 1:14 PM PLOTTED BY: RUSSO, JILL

● 2018 Nitrate Application Locations

Bathymetry Contours For Water Depth

10 Foot Intervals

30 Foot Water Depth Contour

0 1,200 2,400 4,800 7,200

Feet

Date Revised: 5/31/2019 2:41:58 PM

Path: Q:\GIS\GIS_Lake\Baseline_Monitor\MXDs\2018_NitrateInjectLocs.mxd

Figure 8.1

Honeywell

Onondaga Lake
Syracuse, New York

2018 Nitrate Application Locations

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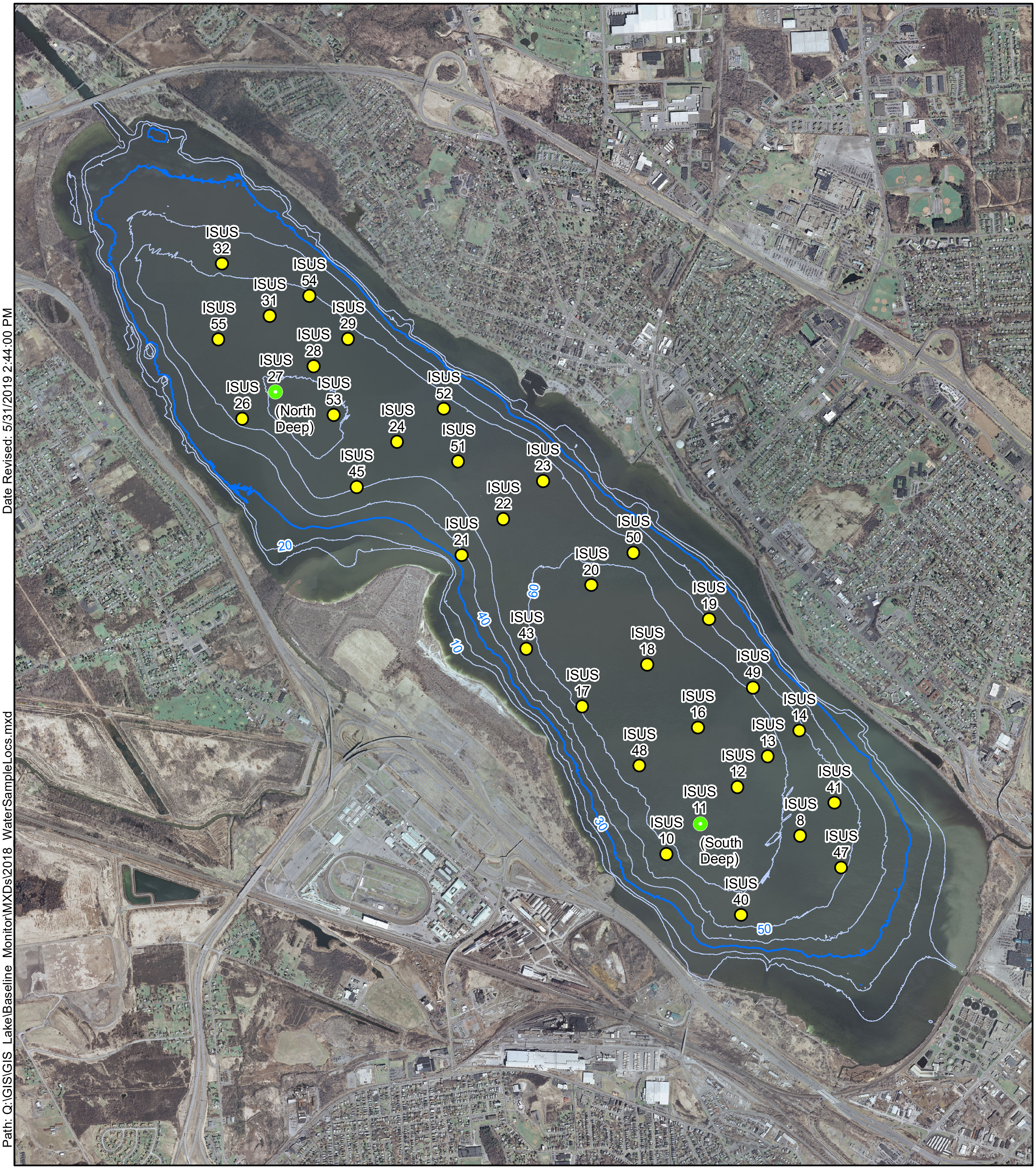

North Deep and South Deep

ISUS-SUNA Monitoring Location

Bathymetry Contours For Water Depth

10 Foot Intervals

30 Foot Water Depth Contour

0 1,200 2,400 4,800 7,200

Feet

Figure 8.2

Honeywell Onondaga Lake
Syracuse, New York

2018 ISUS-SUNA
Monitoring Locations

PARSONS

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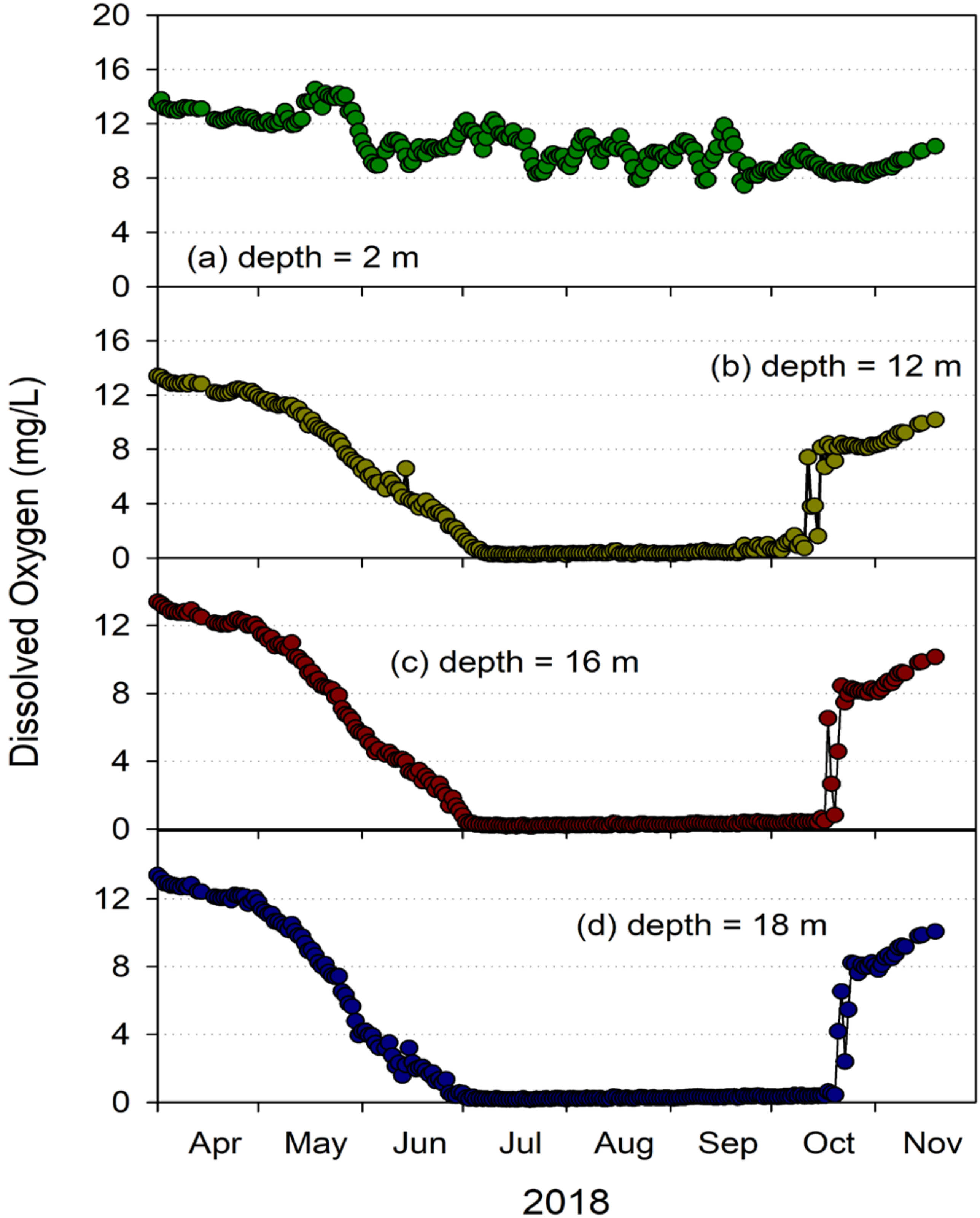

FIGURE 8.3

Honeywell

Onondaga Lake
Syracuse, New York

Measurements of Dissolved Oxygen from the Onondaga Lake South Deep Buoy in 2018: (a) 2, (b) 12, (c) 16, and (d) 18-Meter Water Depths.

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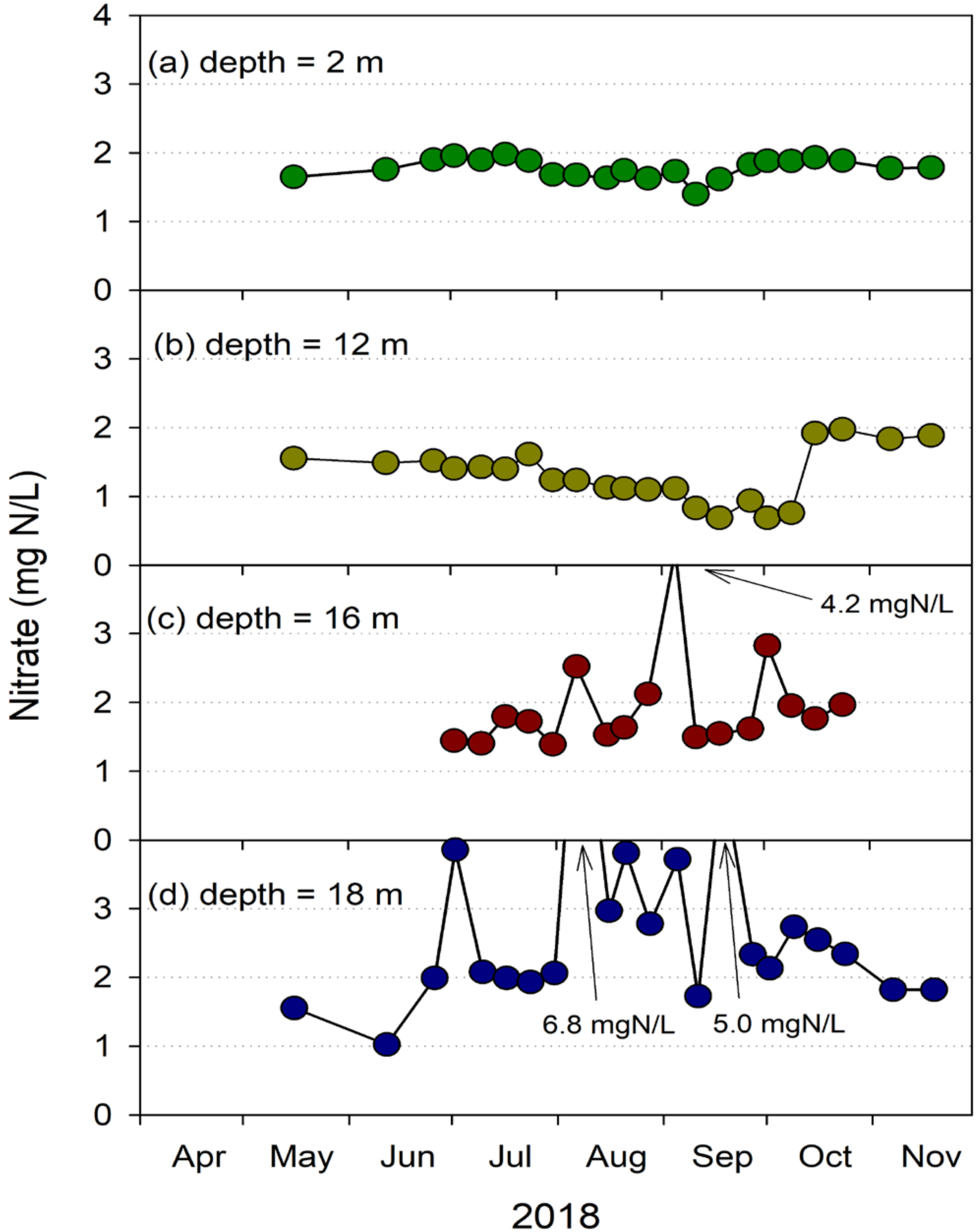

FIGURE 8.4

Honeywell

Onondaga Lake
Syracuse, New York

Laboratory Measurements of Nitrate at Onondaga Lake South Deep in 2018: (a) 2, (b) 12, (c) 16, and (d) 18-meter water depths

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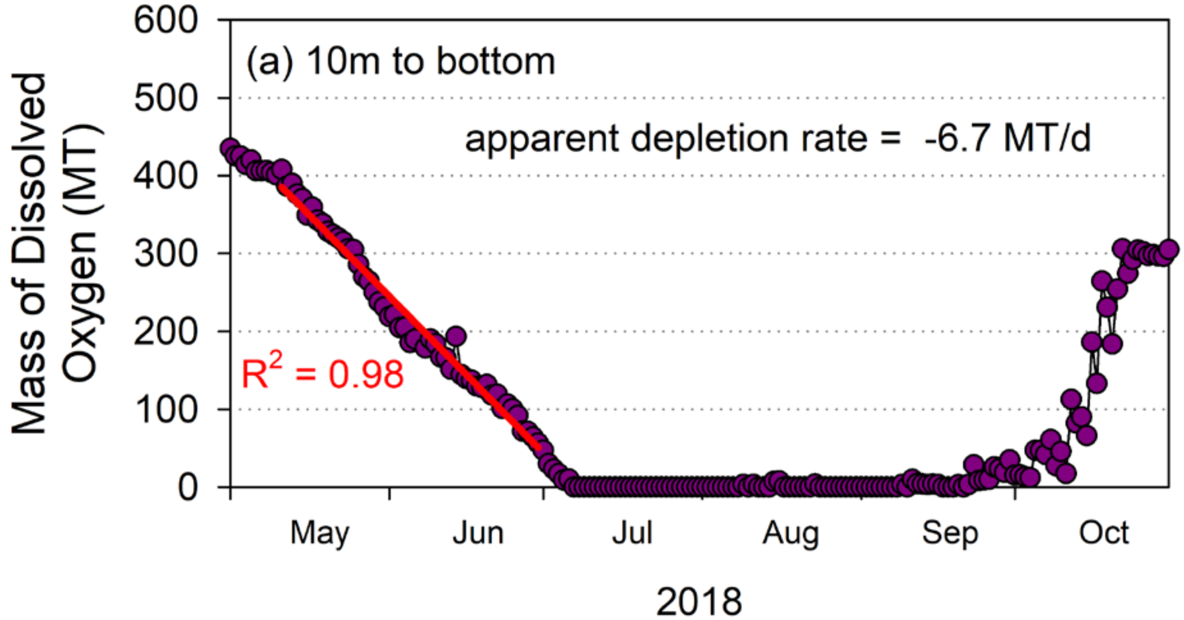

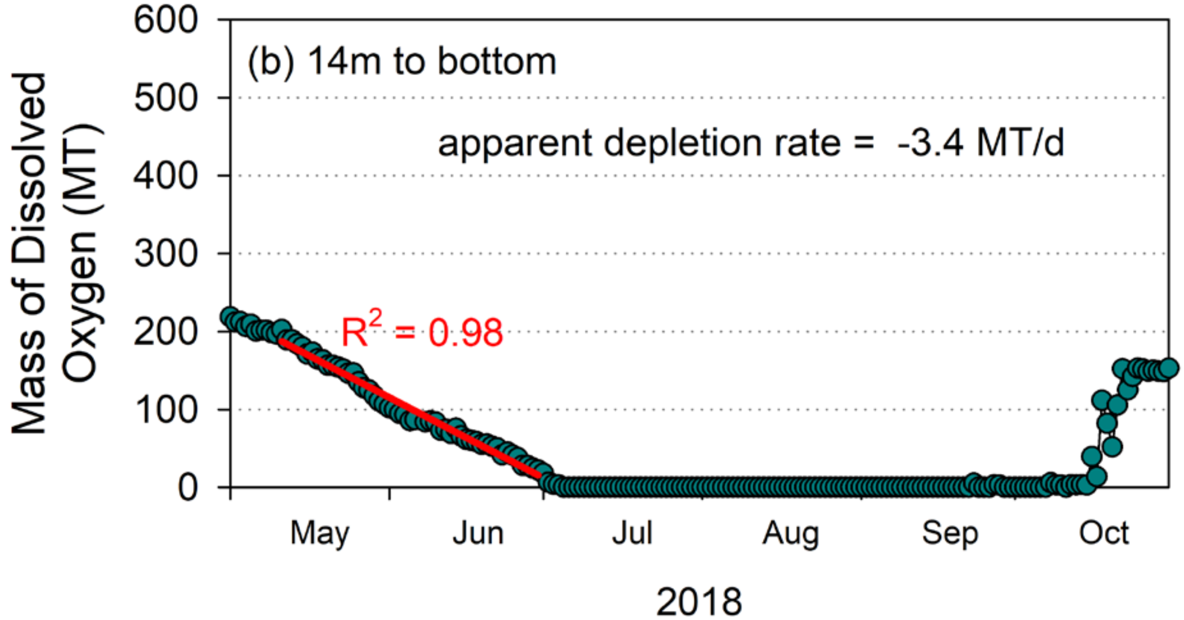

FIGURE 8.5

Honeywell

Onondaga Lake
Syracuse, New York

Dissolved Oxygen Mass in Hypolimnion During 2018 Summer Stratification: (a) 10 meters to the bottom and (b) 14 meters to the bottom

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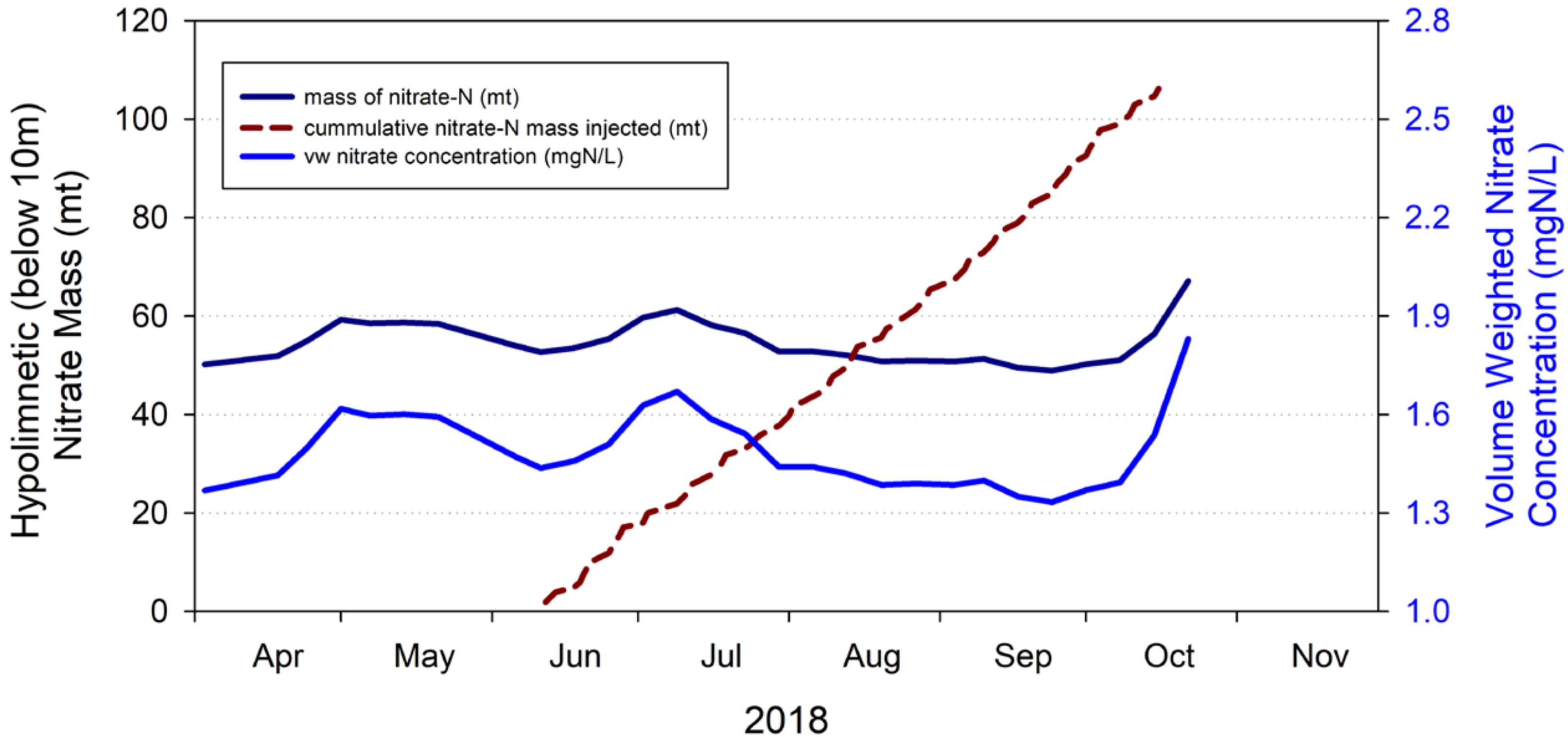

FIGURE 8.6

Honeywell

Onondaga Lake
Syracuse, New York

Hypolimnetic Nitrate Mass, Cumulative Mass of Nitrate Added, and Volume-Weighted Hypolimnetic Average Nitrate

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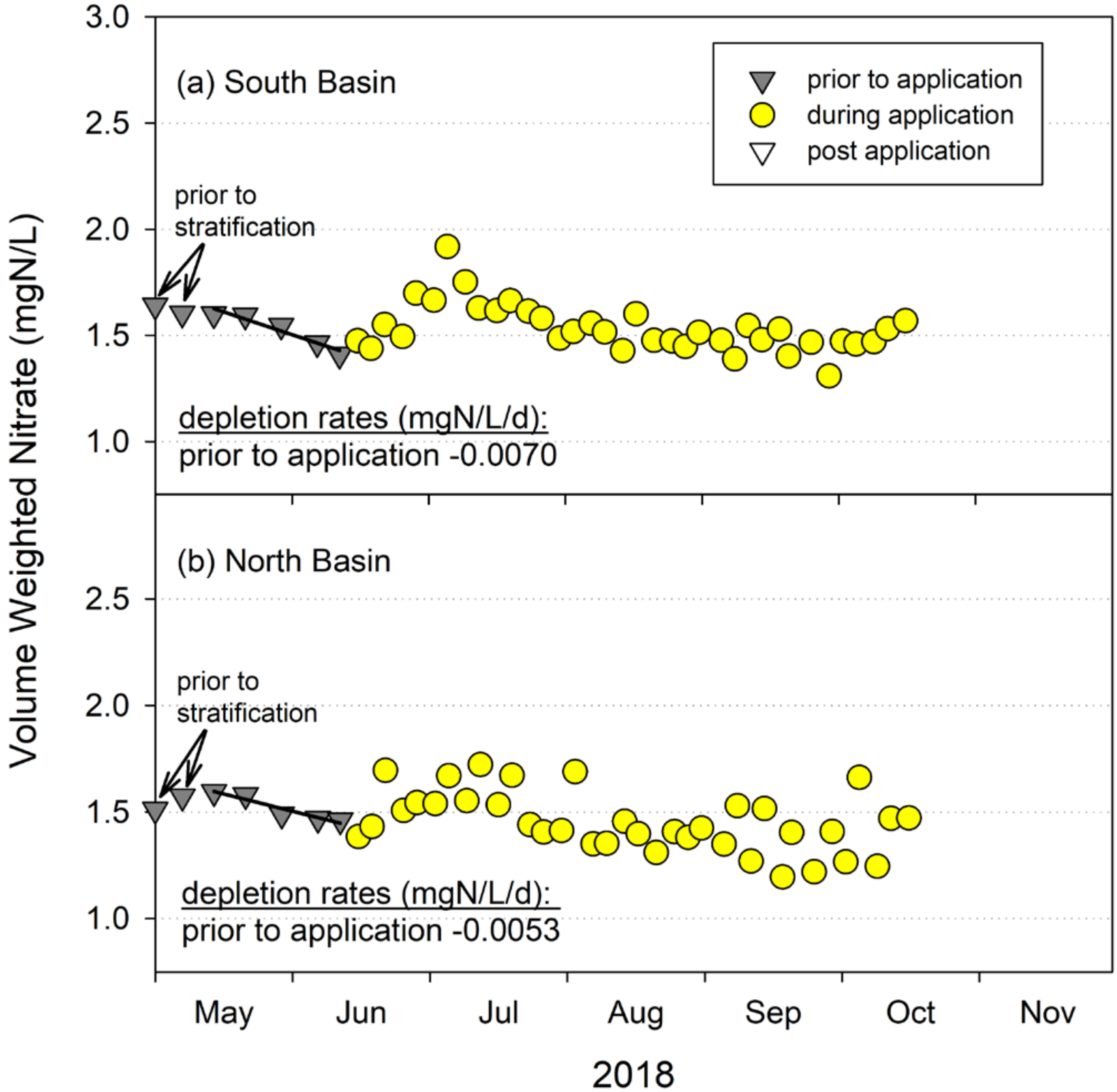

Note: Volume-weighted concentrations for the north and south basins were determined from field nitrate profiles and the respective water volumes of the basins.

FIGURE 8.7

Honeywell

Onondaga Lake
Syracuse, New York

Hypolimnetic Nitrate Mass, Cumulative Mass of Nitrate Added, and Volume-Weighted Hypolimnetic Average Nitrate Concentration in 2018

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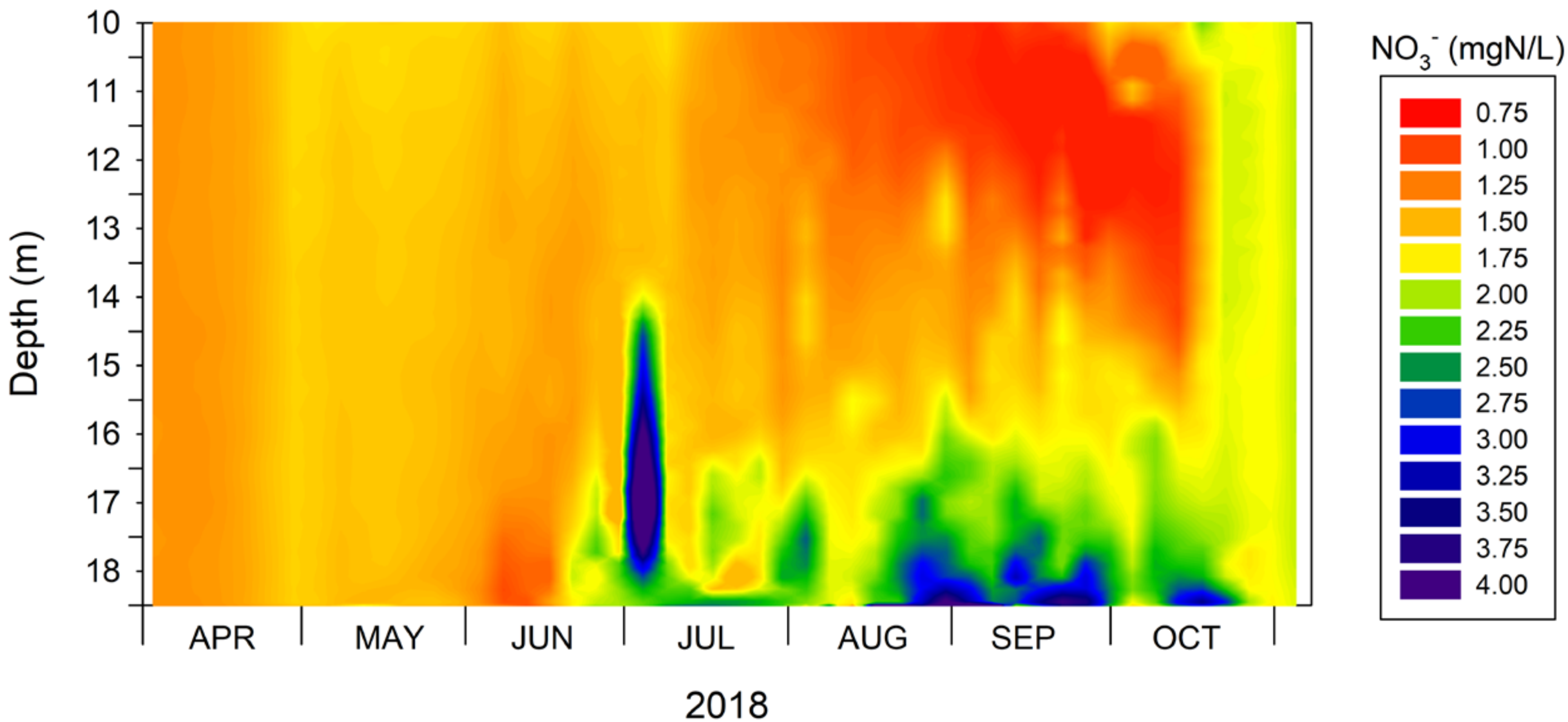

FIGURE 8.8

Honeywell

Onondaga Lake
Syracuse, New York

Nitrate Concentrations in the Hypolimnion (10 meters to bottom) of Onondaga Lake (South Deep) in 2018

PARSONS
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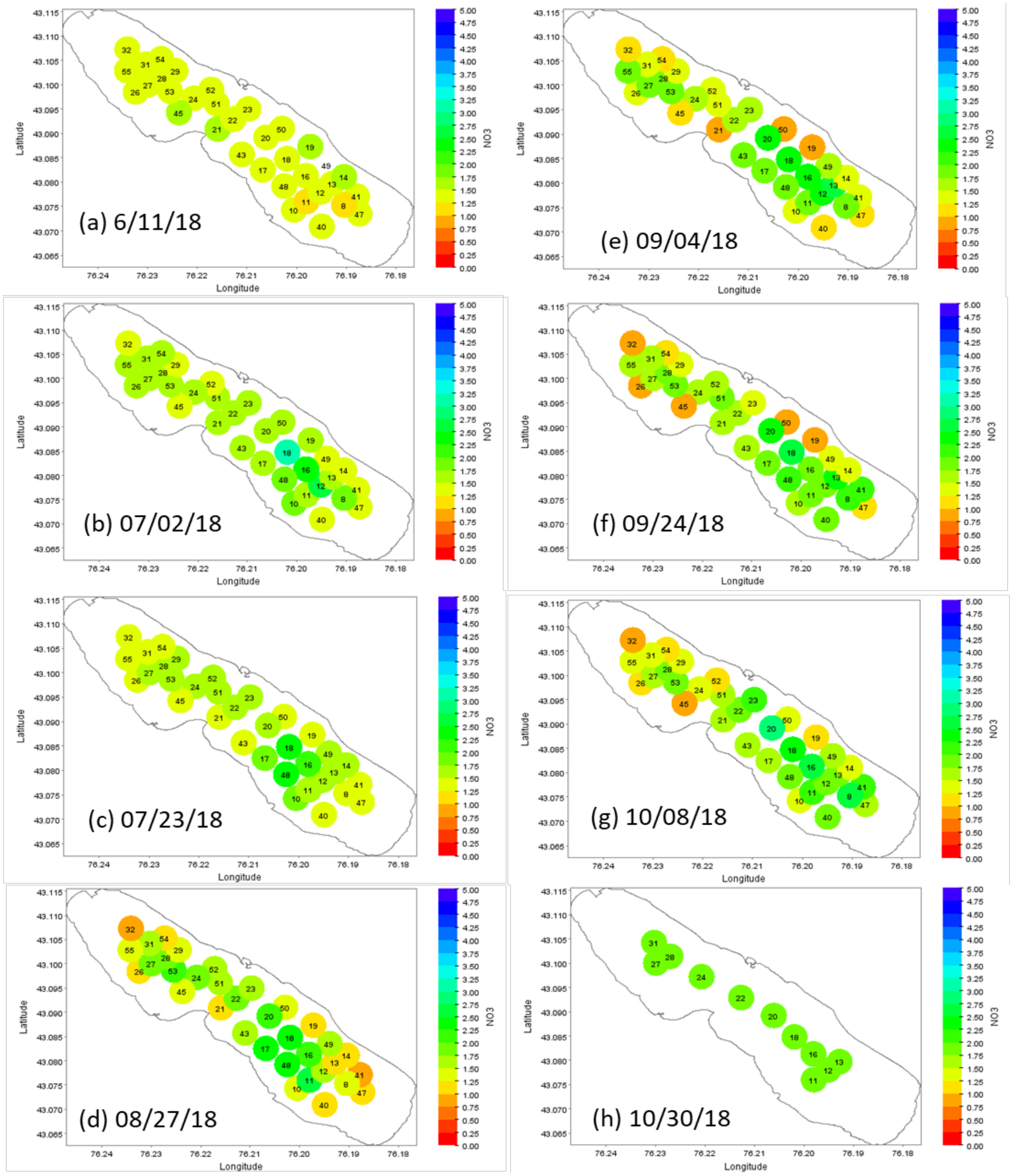

FIGURE 8.9

Honeywell

Onondaga Lake
Syracuse, New York

Representative Plan-view Plots of Nitrate Concentrations (mgN/L) One Meter above the Lake Bottom for Onondaga Lake in 2018

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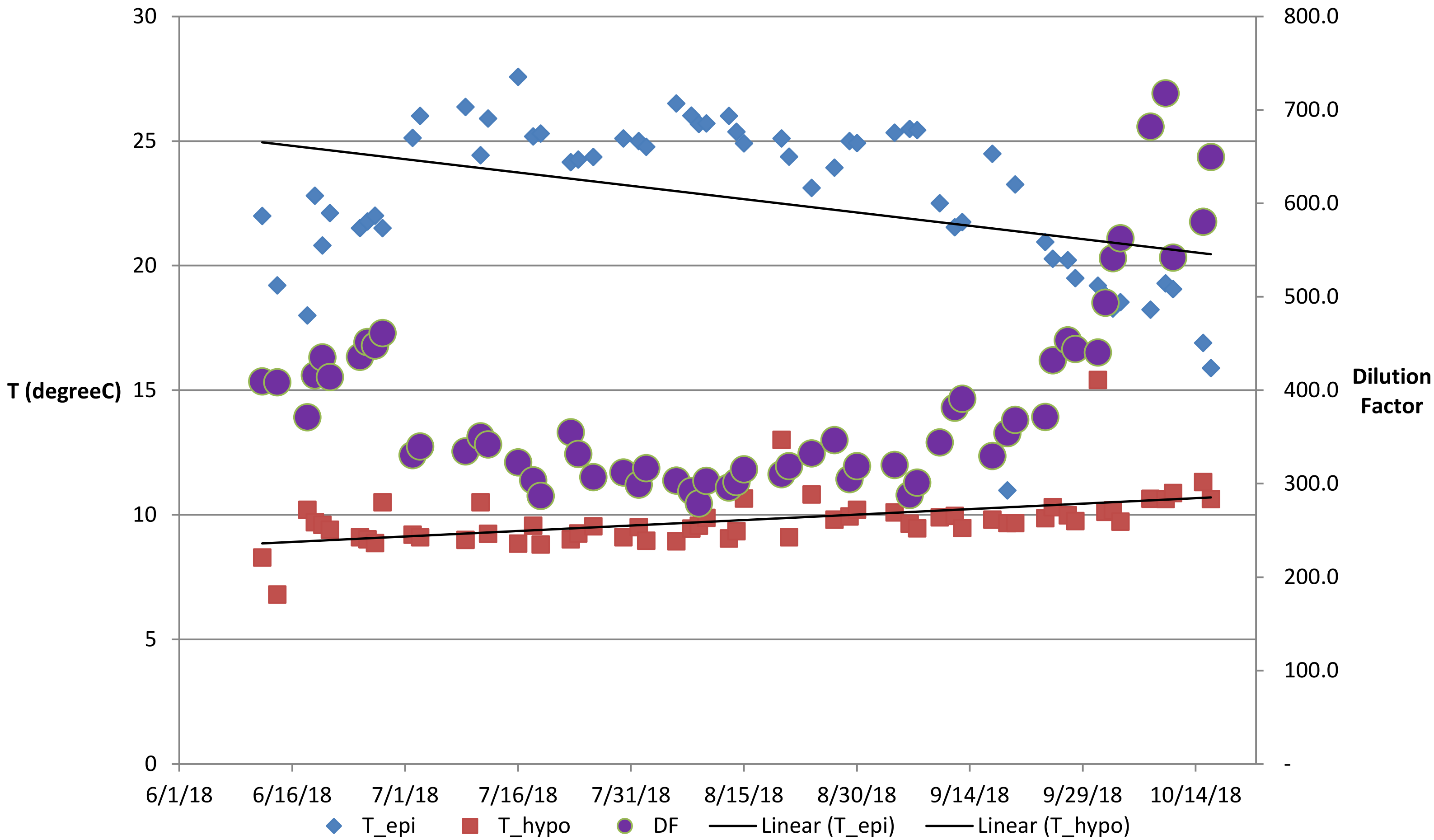

FIGURE 8.10

Honeywell

Onondaga Lake
Syracuse, New York

Epilimnion and Hypolimnion Temperatures and Dilution Factors

PARSONS

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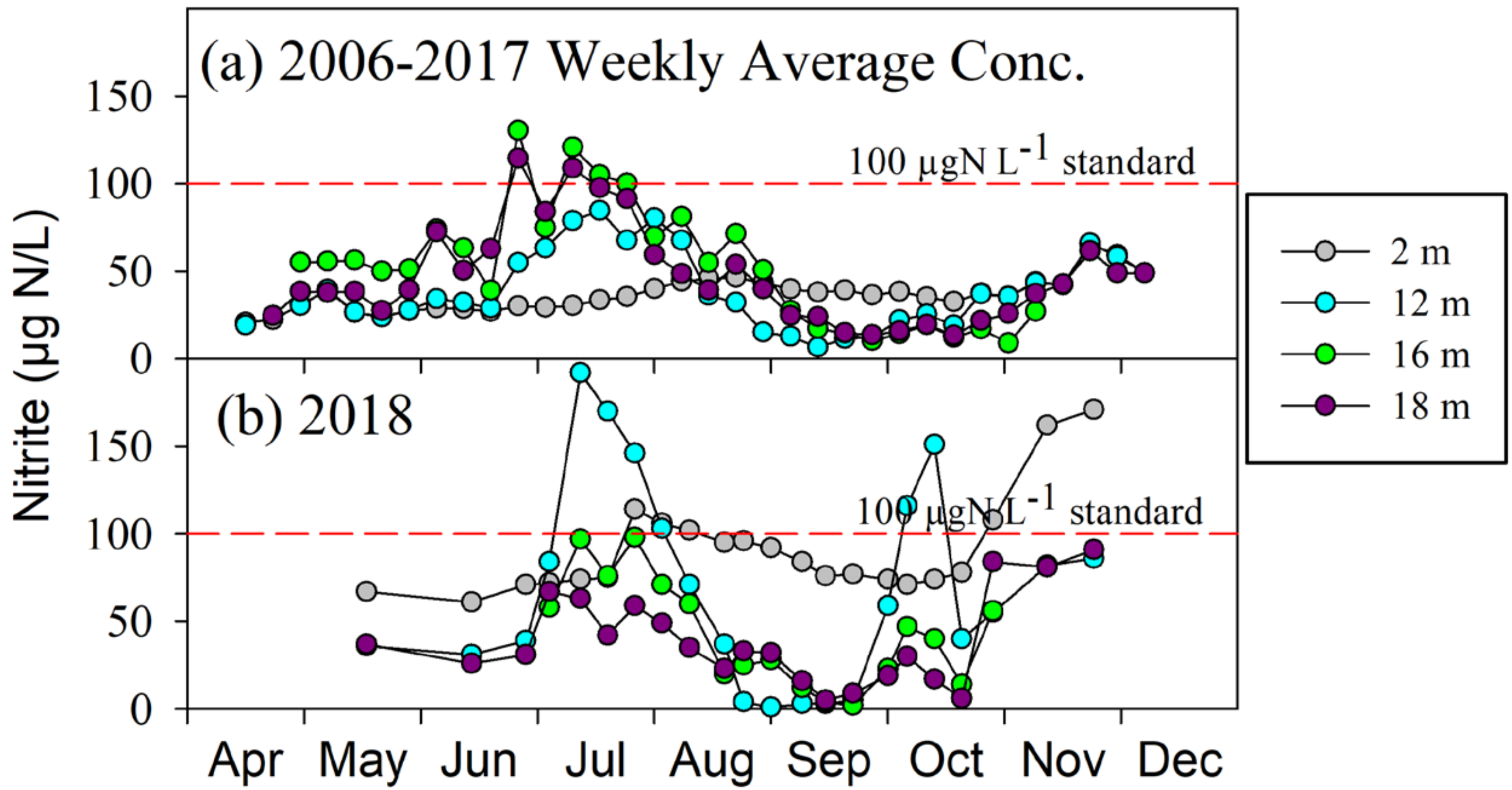

a) weekly average concentration for 2006-2017 and (b) 2018 concentrations. Note: The ambient water quality standard for nitrite applicable to warm-water fisheries is 100 micrograms per liter (µgN/L) as nitrogen (red-dashed line)

FIGURE 8.11

Honeywell

Onondaga Lake
Syracuse, New York

Time Series of Nitrite-Nitrogen (NO2-N) for Onondaga Lake at South Deep for Four Water Depths

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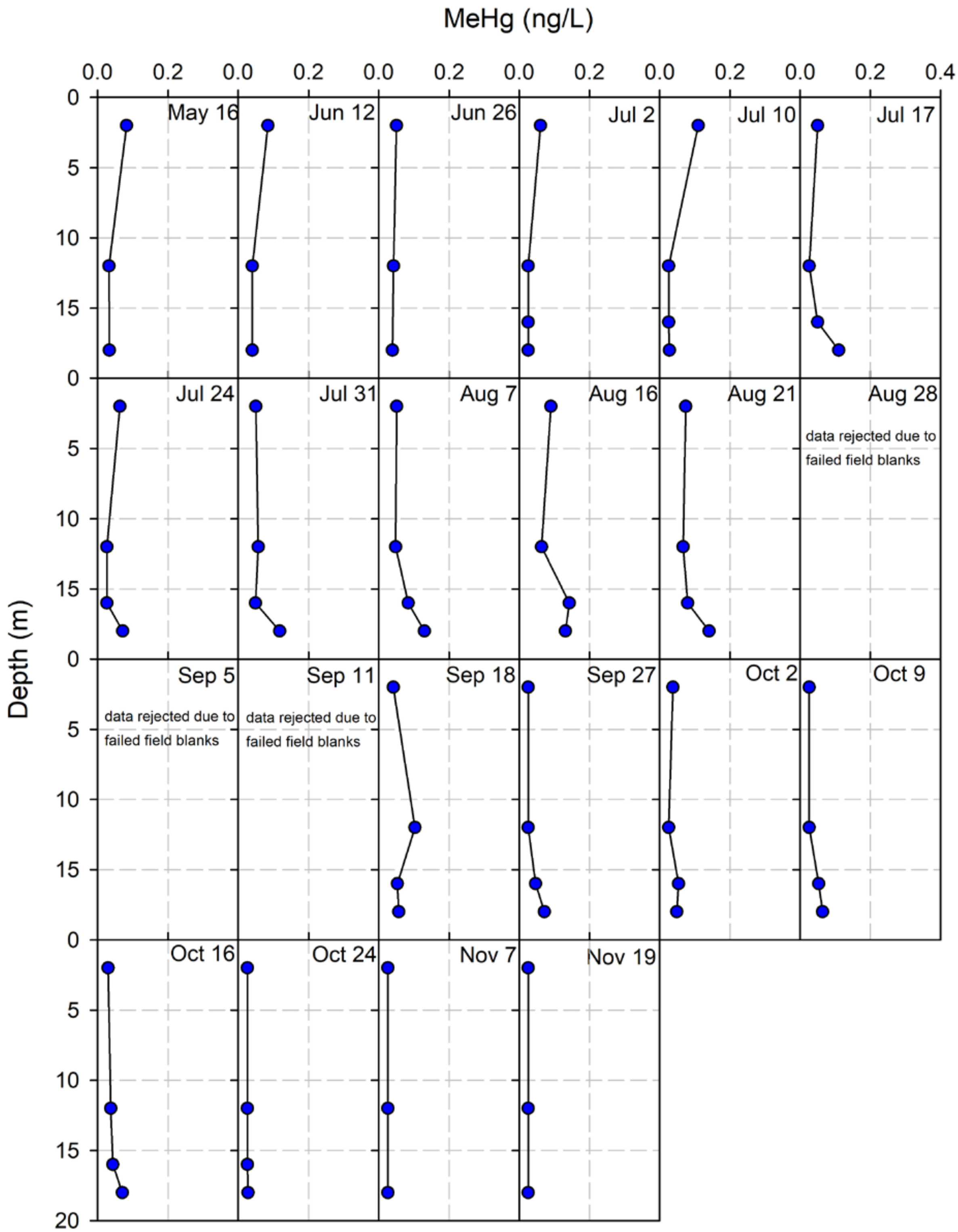

FIGURE 8.12

Honeywell

Onondaga Lake
Syracuse, New York

Vertical Profiles of Methylmercury (MeHg) Concentrations in Onondaga Lake Waters Measured at the South Deep Location: May 16 through November 19, 2018

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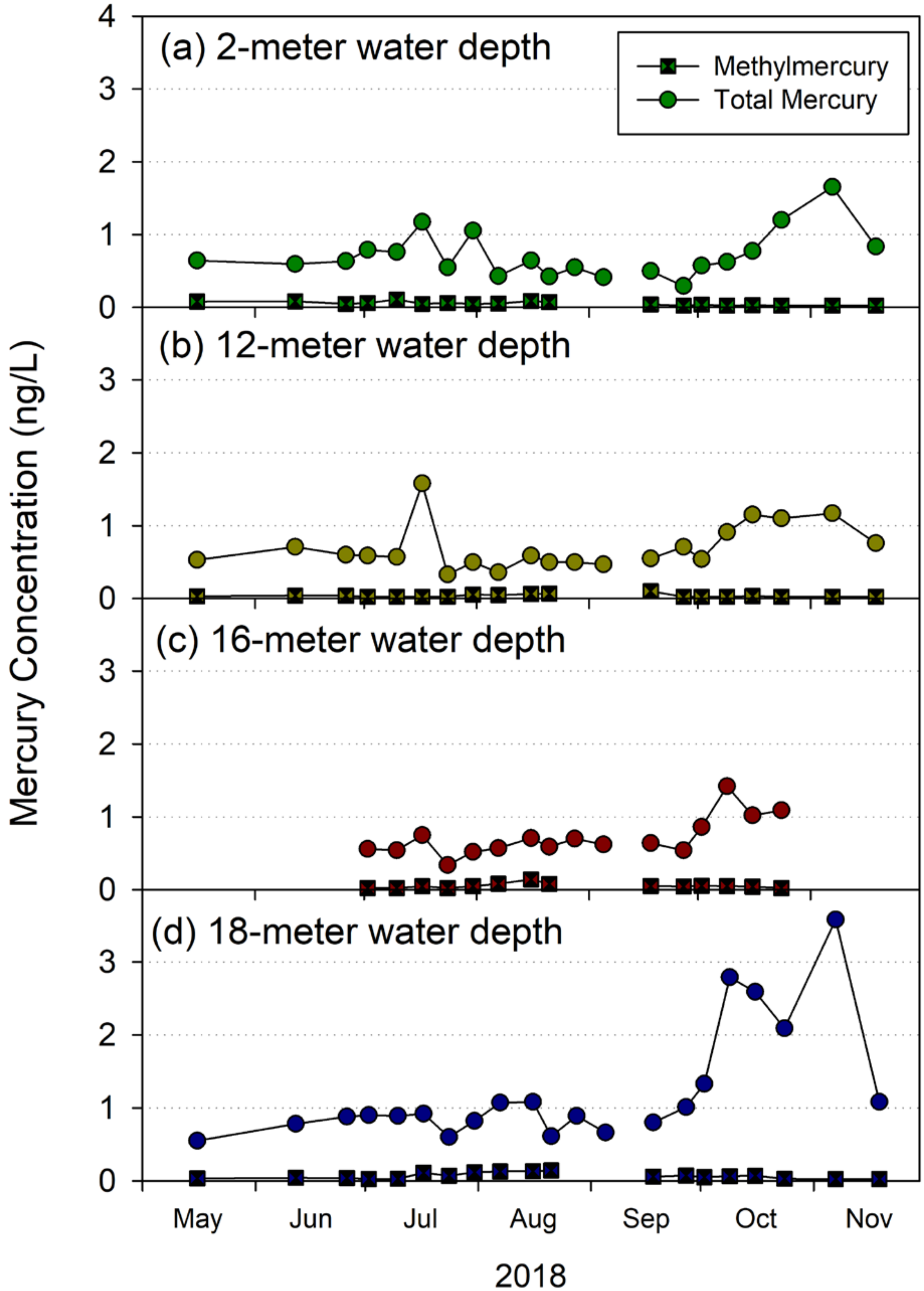

FIGURE 8.13

Honeywell

Onondaga Lake
Syracuse, New York

Total Mercury and Methylmercury Concentrations in Onondaga Lake at the South Deep Location in 2018: (a) 2, (b) 12, (c) 16, and (d) 18-Meter Water Depths.

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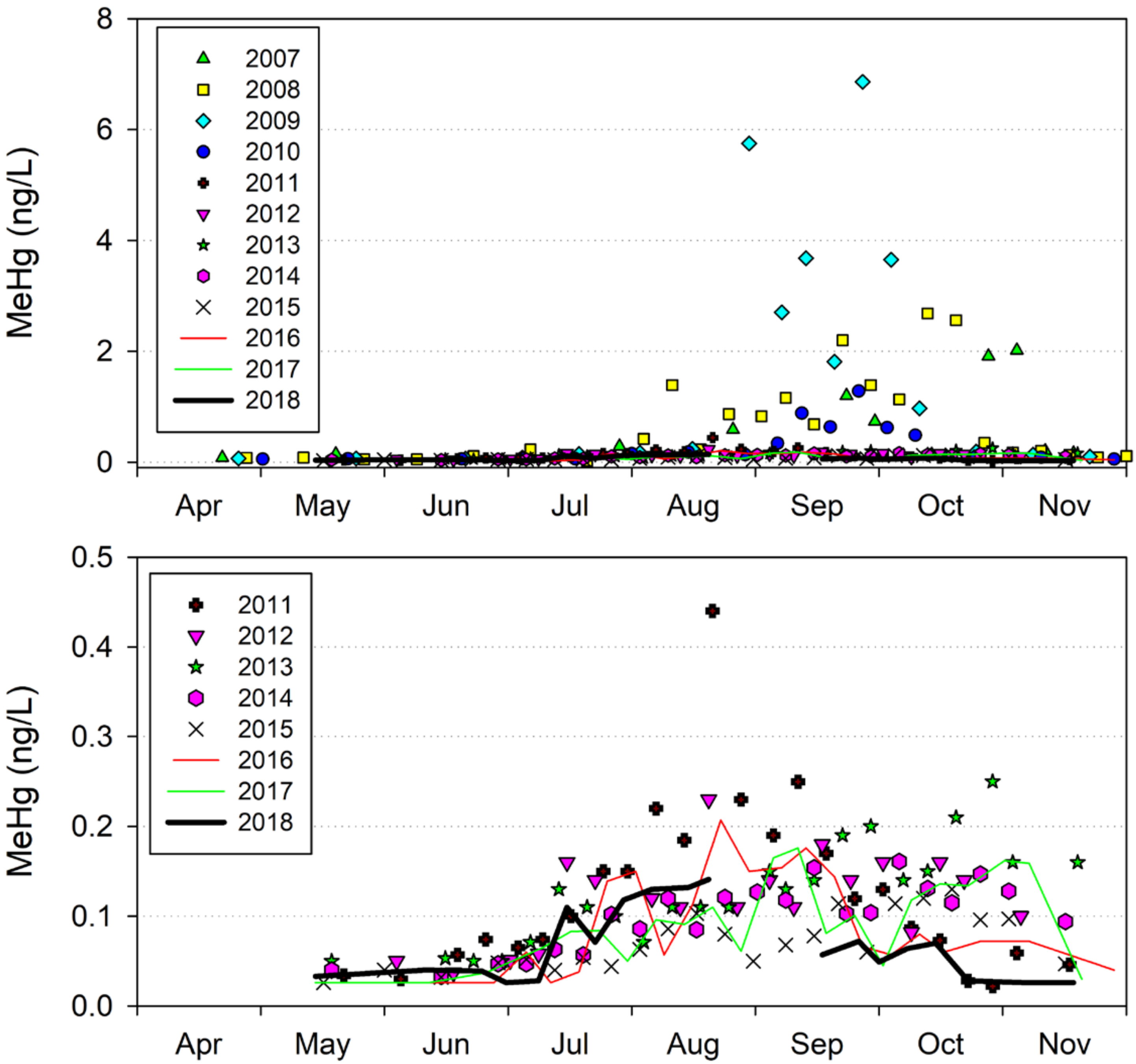

FIGURE 8.14

Honeywell

Onondaga Lake
Syracuse, New York

Time Series of Methylmercury Concentrations for the 18-meter Water Depth at the South Deep Location, 2007-2018. Bottom panel: 2011-2018 only.

PARSONS
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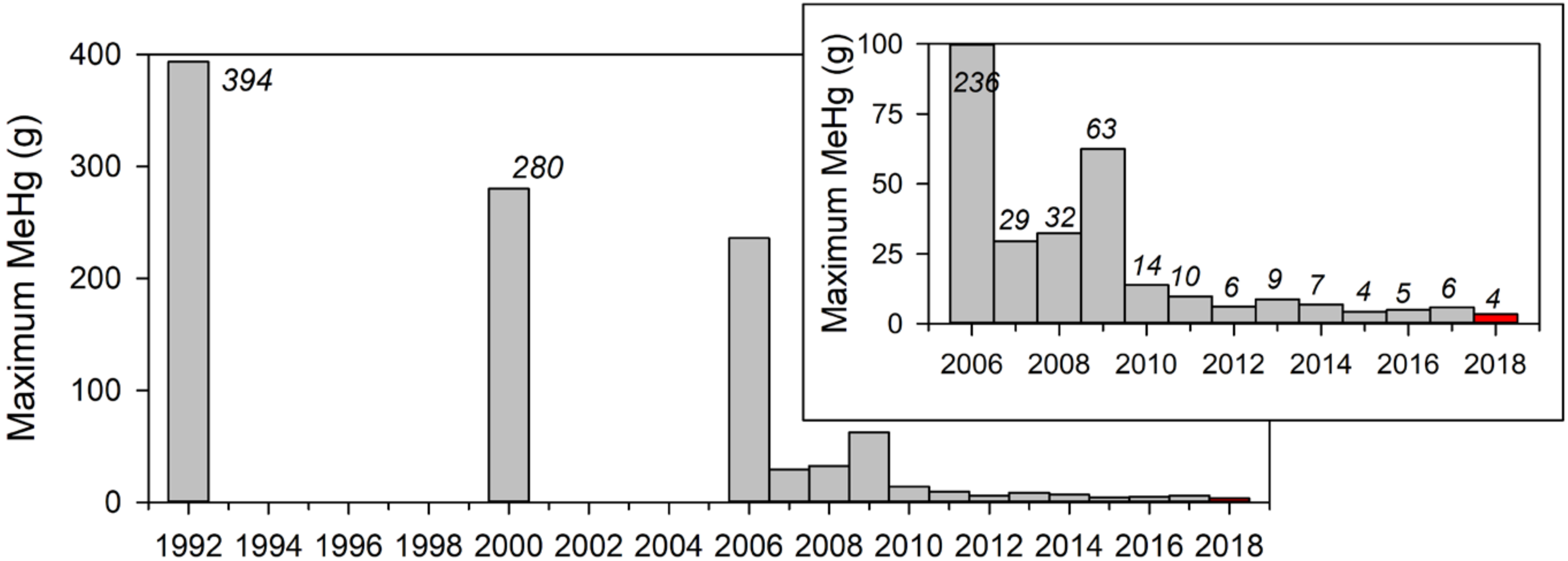

FIGURE 8.15

Honeywell

Onondaga Lake
Syracuse, New York

Annual Maximum Mass of Methylmercury in the Hypolimnion of Onondaga Lake from 1992 through 2018

PARSONS

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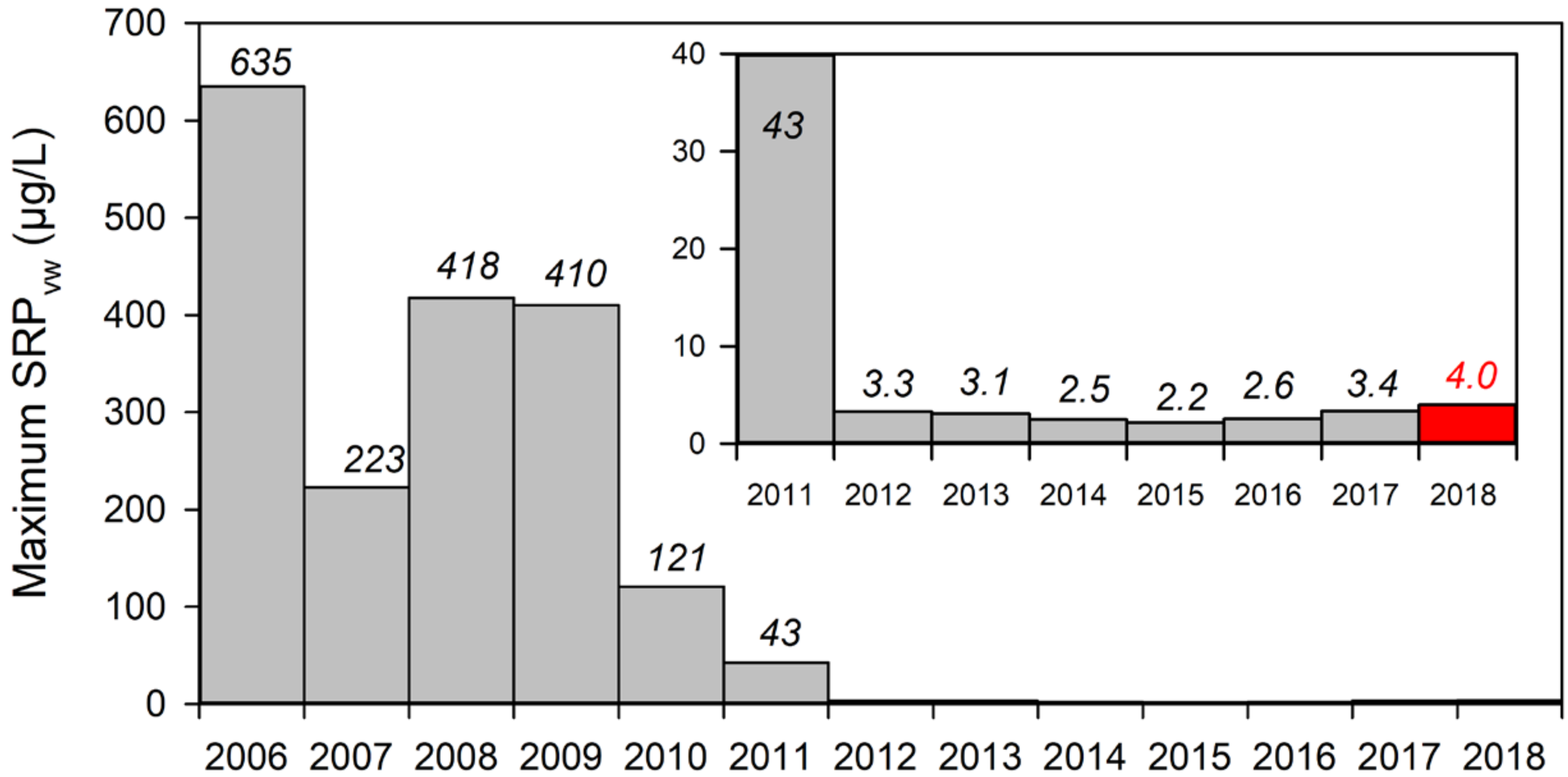

FIGURE 8.16

Honeywell

Onondaga Lake
Syracuse, New York

Annual Maximum Volume Weighted Concentrations of Soluble Reactive Phosphorus (SRP) in the Lower Hypolimnion of Onondaga Lake from 2006 through 2018

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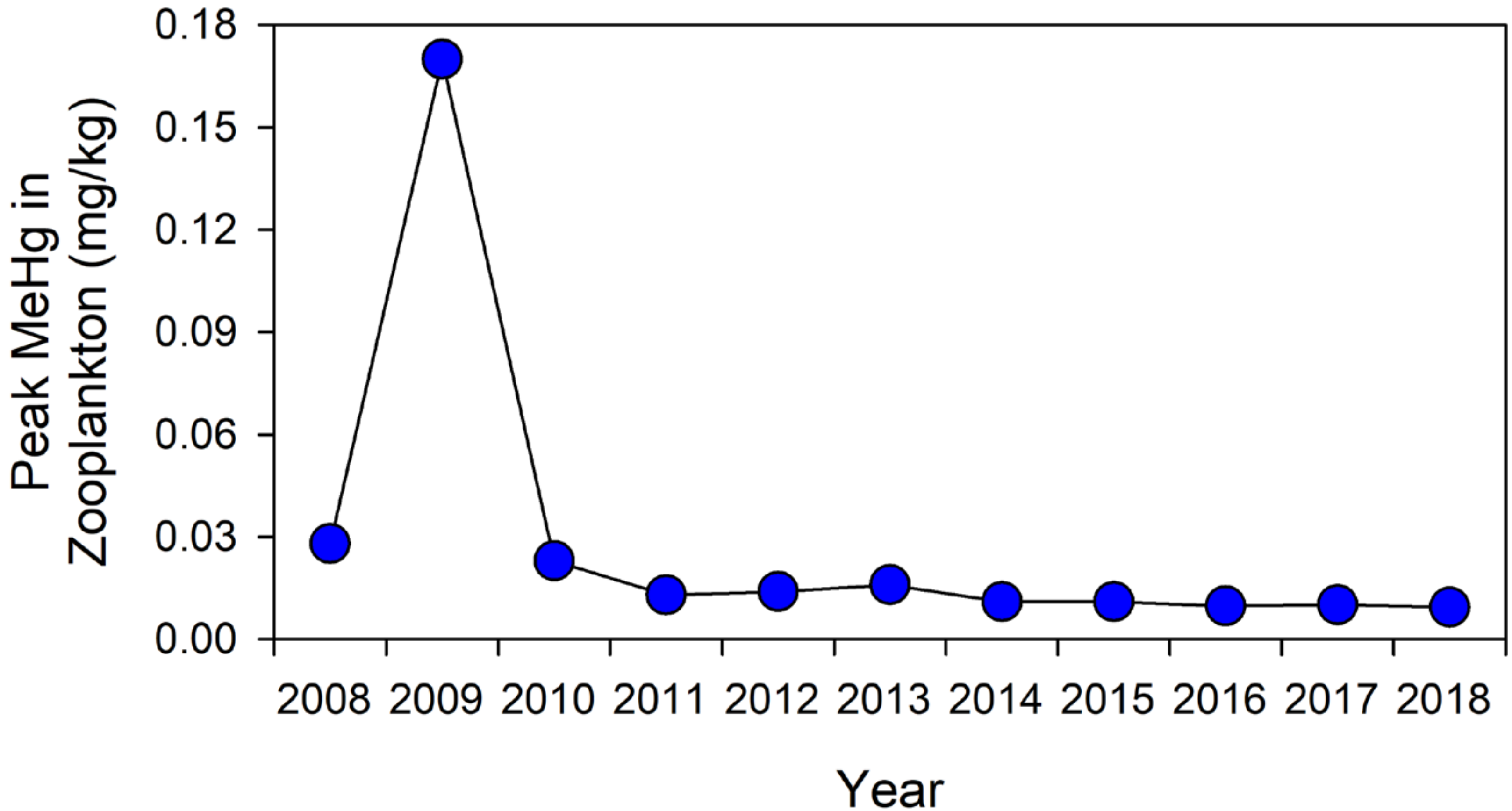

FIGURE 8.17

Honeywell

Onondaga Lake
Syracuse, New York

Time series of annual maximum wet weight mercury concentrations in zooplankton collected from Onondaga Lake annually from 2008 to 2018

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APPENDICES

DVD #1

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Appendix 2B	Vegetation Data
Appendix 2C	Lake-Wide Macrophyte Survey Data
Appendix 2D	Shoreline Survey Data
Appendix 2E	Fish, Wildlife, and Benthic Macroinvertebrate Data
Appendix 3A	Data Usability and Summary Report: Onondaga Lake 2018 Tissue Monitoring
Appendix 3B	Biota Additional Information
Appendix 4A	Data Usability and Summary Report: Onondaga Lake Surface Water Compliance Monitoring
Appendix 5A	Data Usability and Summary Report: Onondaga Lake 2018 Monitored Natural Recovery
Appendix 5B-1	Boring Logs for 2014 Monitored Natural Recovery
Appendix 5B-2	Boring Logs for 2017 Monitored Natural Recovery
Appendix 5C	Memoranda of Visual Inspection of the Onondaga Lake Frozen Cores in 2014, 2015, and 2017 in SMU 8
Appendix 6A	Memorandum: Onondaga Lake Sediment Cap Monitoring - Event-Based Monitoring Evaluation
Appendix 6B	Shoreline Photographs
Appendix 6C	Aerial Photos: Orthomosaics
Appendix 6D	2017 Coring Tables
Appendix 6E	Outboard Area Berm Cross-Sections
Appendix 6F	Data Usability and Summary Report: Onondaga Lake Cap Monitoring
Appendix 6G	2018 Analytical Tables
Appendix 6H	2017 Chemical Bar Charts
Appendix 6I	2017 Analytical Summary Tables
Appendix 6J	2018 Chemical Bar Charts
Appendix 6K	2018 pH Bar Charts
Appendix 8A	Example 2018 One-Day Data Report- September 17, 2018
Appendix 8B	Onondaga Lake Gridding Summary Using a Submersible Ultraviolet Nitrate Analyzer- One Meter Off Bottom Weekly Summary- April 3 through November 5, 2018
Appendix 8C	Data Usability Summary Report: Onondaga Lake 2018 Surface Water Monitoring Associated with Nitrate Addition
Appendix 8D	Plots of Dissolved Oxygen, Nitrate, Manganese, Total Mercury and Methylmercury Concentrations with Depth at South Deep for 2018
Appendix 8E	2018 Total Dissolved Gas Data

Appendix 6C – Aerial Photos

DVD #2

Appendix 6C	Video (1) (2018-10-16_02.mov; 2018-10-16_06.mov; 2018-10-16_07; mov2018-10-16_08.mov)

DVD #3

Appendix 6C	Video (2) (2018-10-16_01.mov; 2018-10-16_03.mov; 2018-10-16_05; mov2018-10-16_05.mov)

APPENDIX 4A

DATA USABILITY AND SUMMARY REPORT
ONONDAGA LAKE SURFACE WATER COMPLIANCE MONITORING

DATA USABILITY SUMMARY REPORT

ONONDAGA LAKE SURFACE WATER COMPLIANCE MONITORING

Prepared For:

Honeywell

101 Columbia Road
Morristown, New Jersey 07962

Prepared By:

PARSONS

301 Plainfield Road, Suite 350
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Phone: (315) 451-9560
Fax: (315) 451-9570

MAY 2019

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1.3.2 Semivolatile Organic Analysis 1-2
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2.1.3 PCB Congeners 2-3
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LIST OF ATTACHMENTS

ATTACHMENT A VALIDATED LABORATORY DATA

SECTION 1

DATA USABILITY SUMMARY

Surface water samples were collected as part of the Onondaga Lake Surface Water Compliance sampling on September 13, 2018 through November 8, 2018. Analytical results from these samples were validated and reviewed by Parsons for usability with respect to the following requirements:

- Work Plan;
- Onondaga Lake QAPP; and
- USEPA Region II Standard Operating Procedures (SOPs) for organic and inorganic data review.

The analytical laboratories for this project were Eurofins – Lancaster and Eurofins – Frontier. The laboratories are certified to conduct project analyses through the New York State Department of Health (NYSDOH) and the National Environmental Laboratory Accreditation Program (NELAP).

1.1 LABORATORY DATA PACKAGES

The laboratory data package turnaround time, defined as the time from sample receipt by the laboratory to receipt of the analytical data packages by Parsons, was 25-47 days for the samples.

The laboratory data packages received from Eurofins were paginated, complete, and overall were of good quality. Comments on specific quality control (QC) and other requirements are discussed in detail in the attached data validation reports which are summarized in Section 2.

1.2 SAMPLING AND CHAIN-OF-CUSTODY

The samples were collected, properly preserved, shipped under a chain-of-custody (COC) record, and received at Eurofins within one day of sampling. All samples were received intact and in good condition at Eurofins.

1.3 LABORATORY ANALYTICAL METHODS

The surface water samples were collected and analyzed for the chemical parameters of interest (CPOI) volatiles, CPOI semivolatiles, polychlorinated biphenyl (PCB) congeners, total and dissolved mercury, and methyl mercury. Summaries of issues concerning these laboratory analyses are presented in Subsections 1.3.1 through 1.3.4. The data qualifications resulting from the data validation review and statements on the laboratory analytical precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are discussed for each analytical method in Section 2 of this Data Usability Summary Report (DUSR). A Level IV data validation (i.e., full data validation) was conducted by Parsons on 10% of the project samples with the remaining 90% of the project samples undergoing a Level III data validation which provides data defensibility. The laboratory data were reviewed and may be qualified with the following validation flags:

"U"	-	not detected at the value given,
"UJ"	-	estimated and not detected at the value given,
"J"	-	estimated at the value given,
"J+"	-	estimated biased high at the value given,
"J-"	-	estimated biased low at the value given,
"N"	-	presumptive evidence at the value given, and
"R"	-	unusable value.

The validated laboratory data were tabulated and are presented in Attachment A.

1.3.1 Volatile Organic Analysis

Surface water samples collected from the site were analyzed for CPOI volatiles using the USEPA SW-846 8260C/8270D analytical methods. Certain reported results for these samples were qualified as not detected based upon blank contamination. The reported volatile analytical results were 100% complete (i.e., usable) for the data presented by Eurofins. PARCCS requirements were met.

1.3.2 Semivolatile Organic Analysis

Surface water samples collected from the site were analyzed for CPOI semivolatiles using the USEPA SW-846 8270D analytical method. The reported results for these samples did not require qualification resulting from data validation. The reported semivolatile analytical results were 100% complete (i.e., usable) for the data presented by Eurofins. PARCCS requirements were met.

1.3.3 PCB Organic Analysis

Surface water samples collected from the site were analyzed for PCB congeners using the USEPA 1668A analytical method. Certain reported results for these samples were qualified as estimated based upon surrogate recoveries and field duplicate precision; and qualified as not detected based upon blank contamination. The reported PCB analytical results were considered 100% complete (i.e., usable) for the data presented by Eurofins. PARCCS requirements were met.

1.3.4 Mercury and Methyl Mercury Analysis

Surface water samples collected from the site were analyzed for total and dissolved mercury using the USEPA 1631E analytical method; and methyl mercury using the USEPA 1630 analytical method. Certain reported results for these samples were qualified as estimated based upon matrix spike recoveries, laboratory duplicate precision, and field duplicate precision. The mercury and methyl mercury results were considered 100% complete (i.e., usable) for the data presented by Eurofins. PARCCS requirements were met.

SECTION 2

DATA VALIDATION REPORT

2.1 SURFACE WATER SAMPLES

Data review has been completed for data packages generated by Eurofins containing surface water samples collected from the site. These samples were contained within sample delivery groups (SDGs) ONO67, ONO68, ONO71, ONO71, 8I00663, and 8K00376. All of these samples were properly preserved, shipped under a COC record, and received intact by the analytical laboratory. The validated laboratory data were tabulated and are presented in Attachment A.

Data validation was performed for all samples in accordance with the project work plan, QAPP, and the USEPA Region II SOPs for organic and inorganic data review. This data validation and usability report is presented by analysis type.

2.1.1 CPOI Volatiles

The following items were reviewed for compliancy in the volatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank and field/equipment/trip blank contamination
- GC/MS instrument performance
- Sample result verification and identification
- Initial and continuing calibrations
- Internal standard area counts and retention times
- Field duplicate precision
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination as discussed below.

Blank Contamination

The QC field blank associated with samples collected on 9/13/18 contained toluene below the reporting limit at a concentration of 0.7 µg/L; and the QC equipment blanks associated with the project samples contained toluene below the reporting limit at concentrations of 0.5 and 0.4 µg/L. Therefore, toluene results less than validation action concentrations were considered not detected and qualified “U” for the affected samples.

Usability

All volatile results for the surface water samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The volatile surface water data presented by Eurofins were 100% complete (i.e., usable). The validated laboratory data are tabulated and presented in Attachment A.

2.1.2 CPOI Semivolatiles

The following items were reviewed for compliancy in the semivolatile analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank and field/equipment blank contamination
- GC/MS instrument performance
- Sample result verification and identification
- Initial and continuing calibrations
- Internal standard area counts and retention times
- Field duplicate precision
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols.

Usability

All semivolatile results for the surface water samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The surface water semivolatile data presented by Eurofins were 100% complete (i.e., usable). The validated laboratory data are tabulated and presented in Attachment A.

2.1.3 PCB Congeners

The following items were reviewed for compliancy in the PCB analysis:

- Custody documentation
- Holding times
- Surrogate recoveries
- Matrix spike/matrix spike duplicate (MS/MSD) precision and accuracy
- Laboratory control sample (LCS) recoveries
- Laboratory method blank and field/equipment blank contamination
- Initial calibrations
- Verification calibrations
- Chromatogram quality
- Sample result verification and identification
- Field duplicate precision
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of surrogate recoveries, blank contamination, and field duplicate precision as discussed below.

Surrogate Recoveries

All surrogate recoveries were considered acceptable and within QC limits with the exception of the 0% surrogate recoveries for 13C2-PCB 111 (QC limit 30-135%R) in samples OL-3140-FB1, -04, -05, -06, -07, and -08; and 13C12-PCB 178 (QC limit 30-135%R) in samples OL-

3140-FB1, -04, -05, -06, -07, and -08. Therefore, associated results which were nondetects were considered estimated and qualified “UJ” for the affected samples.

Blank Contamination

The laboratory method blanks associated with the project samples contained many low concentration PCB congeners; the QC field blank associated with samples collected on 9/14/18 contained PCB 123 and PCB 66 at concentrations of 14.6 and 14.8 pg/L, respectively; the QC field blank associated with samples collected on 11/8/18 contained PCB 16, PCB 22, and PCB 31 at concentrations of 4.28, 7.06, and 14.4 pg/L, respectively; the QC equipment blanks associated with samples collected on 9/14/18 contained PCB 123, PCB 18+30, PCB 20+28, PCB 31, PCB 4, PCB 52, PCB 55, and PCB 66 at concentrations of 19, 13.9, 18.7, 19.5, 12, 23.8, 13.8, and 24.2 pg/L, respectively; and the QC equipment blanks associated with samples collected on 11/8/18 contained many low concentration PCB congeners and PCB 31 at a concentration of 65 pg/L. Therefore, results for these compounds less than validation action concentrations were considered not detected and qualified “U” for the affected samples.

Field Duplicate Precision

All field duplicate precision results were considered acceptable with the exception of the PCB 16 results associated with sample OL-3142-01 (41.3 pg/L) and its field duplicate sample OL-3142-02 (nondetect). Therefore, the results for this compound were considered estimated with the positive result qualified “J” and the nondetected result qualified “UJ” for the field duplicate pair.

Usability

All PCB results for the surface water samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The PCB data for presented by Eurofins were 100% complete with all data considered usable and valid. The validated data are tabulated and presented in Attachment A.

2.1.4 Total and Dissolved Mercury and Methyl Mercury

The following items were reviewed for compliancy in the mercury and methyl mercury analysis:

- Custody documentation
- Holding times
- Initial and continuing calibration verifications

- Initial and continuing calibration blank, laboratory preparation blank, and field blank contamination
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries
- Laboratory duplicate precision
- Laboratory control sample (LCS) recoveries
- Field duplicate precision
- Sample result verification and identification
- Quantitation limits
- Data completeness

These items were considered compliant and acceptable in accordance with the validation protocols with the exception of blank contamination, MS/MSD recoveries, laboratory duplicate precision, and field duplicate precision as discussed below.

Blank Contamination

The continuing calibration blanks associated with the project samples contained total mercury at concentrations ranging 0.15-0.34 ng/L; the QC field blank associated with samples collected on 9/20/18 contained total mercury, dissolved mercury, and methyl mercury at concentrations of 0.38, 0.32, and 0.027 ng/L, respectively; the QC field blank associated with samples collected on 11/8/18 contained total and dissolved mercury at concentrations of 0.12 and 0.10 ng/L, respectively; the initial calibration blank associated with samples collected on 11/8/18 contained methyl mercury at a concentration of 0.006 ng/L; and the continuing calibration blank associated with samples collected on 11/8/18 contained methyl mercury at a concentration of 0.005 ng/L. Validation qualification of the associated samples was not required.

MS/MSD Recoveries

All MS/MSD recoveries were considered acceptable and within QC limits with the exception of the high MSD recovery for methyl mercury (140%R; QC limit 65-130%R) associated with sample OL-3141-10. Therefore, the methyl mercury result was considered estimated and qualified "J" for the affected sample.

Laboratory Duplicate Precision

All laboratory duplicate precision results were considered acceptable and within QC limits with the exception of the precision for mercury (32.6%RPD; QC limit 0-24%RPD) associated with sample OL-3141-01. Therefore, the mercury result was considered estimated and qualified "J" for the affected sample.

Field Duplicate Precision

All field duplicate precision results were considered acceptable with the exception of the results for total mercury (84%RPD) and methyl mercury (nondetect and 0.087 ng/L) associated with sample OL-3141-01 and its field duplicate OL-3141-02. Therefore, results for these analytes were considered estimated with positive results qualified “J” and nondetected results qualified “UJ” for the affected parent sample and field duplicate.

Usability

All mercury and methyl mercury results for the surface water samples were considered usable following data validation.

Summary

The quality assurance objectives for measurement data included considerations for precision, accuracy, representativeness, completeness, comparability, and sensitivity. The mercury and methyl mercury data for the surface water samples presented by Eurofins were 100% complete (i.e., usable). The validated laboratory data are tabulated and presented in Attachment A.

ATTACHMENT A

VALIDATED LABORATORY DATA

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
				Field Sample ID	OL-3140-01		OL-3140-02		OL-3141-01		OL-3141-02		OL-3140-03		OL-3141-03	
				Depth (ft)	6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
				Date Sampled	09/14/2018		09/14/2018		09/20/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		ONO67		8I00663		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		FD		REG		FD		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N					0.000026	UJ	0.000087	J			0.000033	J
E1631	7439-97-6	MERCURY	ug/l	N					0.00098	J	0.0004	J			0.00043	J
E1631	7439-97-6	MERCURY	ug/l	Y					0.00018	J	0.00017	J			0.00012	J
E1668	33146-45-1	10-DiCB	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	74472-36-9	112-PeCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	41411-61-4	142-HxCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	68194-15-0	143-HxCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	41411-62-5	160-HxCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74472-43-8	161-HxCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	39635-34-2	162-HxCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74472-45-0	164-HxCB	pg/L	N	22.3	J	20.2	J					24.1	J		
E1668	74472-46-1	165-HxCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-76-0	203-OcCB	pg/L	N	114	U	113	U					113	U		
E1668	52663-58-8	64-TeCB	pg/L	N	14.3	J	13.4	J					75.5	U		
E1668	41464-42-0	72-TeCB	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	31508-00-6	PCB 118	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	2051-24-3	PCB 209	pg/L	N	952	U	943	U					943	U		
E1668	35693-99-3	PCB 52	pg/L	N	44.2	J	45.6	J					65.2	J		
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	2051-60-7	PCB-1	pg/L	N	190	U	189	U					189	U		
E1668	60145-21-3	PCB-103	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	56558-16-8	PCB-104	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	32598-14-4	PCB-105	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	70424-69-0	PCB-106/118	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	70424-68-9	PCB-107	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB108+124	PCB-108/124	pg/L	N	152	U	151	U					151	U		
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N	457	U	453	U					453	U		
E1668	2050-67-1	PCB-11	pg/L	N	286	U	283	U					283	U		
E1668	39635-32-0	PCB-111	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB11390101	PCB-113/90/101	pg/L	N	229	U	226	U					226	U		
E1668	74472-37-0	PCB-114	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB12+13	PCB-12/13	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	68194-12-7	PCB-120	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	56558-18-0	PCB-121	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	76842-07-4	PCB-122	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	65510-44-3	PCB-123	pg/L	N	16.5	J	18.0	J					19.0	J		
E1668	57465-28-8	PCB-126	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	39635-33-1	PCB-127	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB128+166	PCB-128/166	pg/L	N	152	U	151	U					151	U		
E1668	52663-66-8	PCB-130	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	61798-70-7	PCB-131	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	38380-05-1	PCB-132	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	35694-04-3	PCB-133	pg/L	N	76.2	U	75.5	U					75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
				Field Sample ID	OL-3140-01		OL-3140-02		OL-3141-01		OL-3141-02		OL-3140-03		OL-3141-03	
				Depth (ft)	6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
				Date Sampled	09/14/2018		09/14/2018		09/20/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		ONO67		8I00663		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		FD		REG		FD		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52704-70-8	PCB-134	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	38411-22-2	PCB-136	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	35694-06-5	PCB-137	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB138163129	PCB-138/163/129	pg/L	N	229	U	226	U					226	U		
E1668	PCB139+140	PCB-139/140	pg/L	N	152	U	151	U					151	U		
E1668	34883-41-5	PCB-14	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	52712-04-6	PCB-141	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	68194-14-9	PCB-144	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74472-40-5	PCB-145	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	51908-16-8	PCB-146	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB147+149	PCB-147/149	pg/L	N	152	U	151	U					151	U		
E1668	74472-41-6	PCB-148	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	2050-68-2	PCB-15	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	68194-08-1	PCB-150	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB151+135	PCB-151/135	pg/L	N	152	U	151	U					151	U		
E1668	68194-09-2	PCB-152	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	38380-01-7	PCB-153	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB153+168	PCB-153/168	pg/L	N	152	U	151	U					151	U		
E1668	60145-22-4	PCB-154	pg/L	N	190	U	189	U					189	U		
E1668	33979-03-2	PCB-155	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB156+157	PCB-156/157	pg/L	N	152	U	151	U					151	U		
E1668	74472-42-7	PCB-158	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	39635-35-3	PCB-159	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	38444-78-9	PCB-16	pg/L	N	10.2	J	12.3	J					37.7	U		
E1668	52663-72-6	PCB-167	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	32774-16-6	PCB-169	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	37680-66-3	PCB-17	pg/L	N	19.7	J	15.8	J					28.5	J		
E1668	35065-30-6	PCB-170	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB171+173	PCB-171/173	pg/L	N	152	U	151	U					151	U		
E1668	52663-74-8	PCB-172	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	38411-25-5	PCB-174	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	40186-70-7	PCB-175	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-65-7	PCB-176	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-70-4	PCB-177	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-67-9	PCB-178	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-64-6	PCB-179	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB180+193	PCB-180/193	pg/L	N	152	U	151	U					151	U		
E1668	74472-47-2	PCB-181	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	60145-23-5	PCB-182	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-68-0	PCB-183	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74472-48-3	PCB-184	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74472-49-4	PCB-186	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74487-85-7	PCB-188	pg/L	N	190	U	189	U					189	U		
E1668	39635-31-9	PCB-189	pg/L	N	76.2	U	75.5	U					75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
				Field Sample ID	OL-3140-01		OL-3140-02		OL-3141-01		OL-3141-02		OL-3140-03		OL-3141-03	
				Depth (ft)	6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
				Date Sampled	09/14/2018		09/14/2018		09/20/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		ONO67		8I00663		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		FD		REG		FD		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-73-4	PCB-19	pg/L	N	9.48	J	8.95	J					16.30	J		
E1668	41411-64-7	PCB-190	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74472-50-7	PCB-191	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74472-51-8	PCB-192	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	35694-08-7	PCB-194	pg/L	N	114	U	113	U					113	U		
E1668	52663-78-2	PCB-195	pg/L	N	114	U	113	U					113	U		
E1668	42740-50-1	PCB-196/203	pg/L	N	114	U	113	U					113	U		
E1668	PCB198+199	PCB-198/199	pg/L	N	229	U	226	U					226	U		
E1668	2051-61-8	PCB-2	pg/L	N	190	U	189	U					189	U		
E1668	40186-71-8	PCB-201	pg/L	N	381	U	377	U					377	U		
E1668	2136-99-4	PCB-202	pg/L	N	114	U	113	U					113	U		
E1668	74472-52-9	PCB-204	pg/L	N	114	U	113	U					113	U		
E1668	74472-53-0	PCB-205	pg/L	N	114	U	113	U					113	U		
E1668	40186-72-9	PCB-206	pg/L	N	114	U	113	U					113	U		
E1668	52663-79-3	PCB-207	pg/L	N	114	U	113	U					113	U		
E1668	52663-77-1	PCB-208	pg/L	N	114	U	113	U					113	U		
E1668	PCB21+33	PCB-21/33	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	38444-85-8	PCB-22	pg/L	N	7.87	J	7.22	J					10.20	J		
E1668	55720-44-0	PCB-23	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	55702-45-9	PCB-24	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	55712-37-3	PCB-25	pg/L	N	9.55	J	8.64	J					17.00	J		
E1668	38444-76-7	PCB-27	pg/L	N	6.07	J	6.21	J					13.90	J		
E1668	PCB28+20	PCB-28/20	pg/L	N	24.5	J	25.9	J					39.8	J		
E1668	PCB29+26	PCB-29/26	pg/L	N	76.2	U	75.5	U					28.8	J		
E1668	2051-62-9	PCB-3	pg/L	N	190	U	189	U					189	U		
E1668	16606-02-3	PCB-31	pg/L	N	32.1	J	31.8	J					49.1			
E1668	38444-77-8	PCB-32	pg/L	N	12.5	J	37.7	U					19.8	J		
E1668	37680-68-5	PCB-34	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	37680-69-6	PCB-35	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	38444-87-0	PCB-36	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	38444-90-5	PCB-37	pg/L	N	38.1	U	37.7	U					6.2	J		
E1668	53555-66-1	PCB-38	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	38444-88-1	PCB-39	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	13029-08-8	PCB-4	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	52663-59-9	PCB-41	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	36559-22-5	PCB-42	pg/L	N	76.2	U	75.5	U					15.8	J		
E1668	70362-46-8	PCB-43	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N	42.5	J	41.4	J					55.9	J		
E1668	70362-45-7	PCB-45	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	41464-47-5	PCB-46	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	70362-47-9	PCB-48	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	16605-91-7	PCB-5	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	PCB50+53	PCB-50/53	pg/L	N	286	U	283	U					283	U		
E1668	68194-04-7	PCB-51	pg/L	N	76.2	U	75.5	U					75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
				Field Sample ID	OL-3140-01		OL-3140-02		OL-3141-01		OL-3141-02		OL-3140-03		OL-3141-03	
				Depth (ft)	6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
				Date Sampled	09/14/2018		09/14/2018		09/20/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		ONO67		8I00663		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		FD		REG		FD		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	15968-05-5	PCB-54	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	74338-24-2	PCB-55	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	41464-43-1	PCB-56	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	70424-67-8	PCB-57	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	41464-49-7	PCB-58	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N	229	U	226	U					226	U		
E1668	25569-80-6	PCB-6	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N	305	U	302	U					302	U		
E1668	74472-34-7	PCB-63	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	32598-10-0	PCB-66	pg/L	N	16.7	J	18.3	J					21.2	J		
E1668	73575-53-8	PCB-67	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	73575-52-7	PCB-68	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB69+49	PCB-69/49	pg/L	N	27.8	J	26.4	J					38.6	J		
E1668	33284-50-3	PCB-7	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	74338-23-1	PCB-73	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	32598-13-3	PCB-77	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	70362-49-1	PCB-78	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	41464-48-6	PCB-79	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	34883-43-7	PCB-8	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	33284-52-5	PCB-80	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	70362-50-4	PCB-81	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-62-4	PCB-82	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	60145-20-2	PCB-83	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	52663-60-2	PCB-84	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	55215-17-3	PCB-88	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	73575-57-2	PCB-89	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	34883-39-1	PCB-9	pg/L	N	38.1	U	37.7	U					37.7	U		
E1668	52663-61-3	PCB-92	pg/L	N	22.1	J	24.1	J					24.7	J		
E1668	73575-55-0	PCB-94	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	38379-99-6	PCB-95	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	73575-54-9	PCB-96	pg/L	N	76.2	U	75.5	U					75.5	U		
E1668	PCB110+115	PCB110+115	pg/L	N	152	U	151	U					151	U		
E1668	PCB18+30	PCB18+30	pg/L	N	25.8	J	28.4	J					46.7	J		
E1668	PCB183+185	PCB183+185	pg/L	N	152	U	151	U					151	U		
E1668	PCB197+200	PCB197+200	pg/L	N	229	U	226	U					226	U		
E1668	PCB40+71	PCB40+71	pg/L	N	152	U	151	U					151	U		
E1668	PCB85116117	PCB85+116+117	pg/L	N	229	U	226	U					226	U		
E1668	PCB93+100	PCB93+100	pg/L	N	152	U	151	U					151	U		
E1668	PCB98+102	PCB98+102	pg/L	N	190	U	189	U					189	U		
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	N	5	U	5	U					5	U		
SW8260	108-70-3	1,3,5-TRICHLOROBENZENE	ug/l	N	5	U	5	U					5	U		
SW8260	71-43-2	BENZENE	ug/l	N	1	U	1	U					1	U		
SW8260	108-90-7	CHLOROBENZENE	ug/l	N	1	U	1	U					1	U		
SW8260	100-41-4	ETHYLBENZENE	ug/l	N	1	U	1	U					1	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
				Field Sample ID	OL-3140-01		OL-3140-02		OL-3141-01		OL-3141-02		OL-3140-03		OL-3141-03	
				Depth (ft)	6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
				Date Sampled	09/14/2018		09/14/2018		09/20/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		ONO67		8I00663		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		FD		REG		FD		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
SW8260	95-47-6	O-XYLENE	ug/l	N	1	U	1	U					1	U		
SW8260	108-88-3	TOLUENE	ug/l	N	1	U	1	U					1	U		
SW8260	1330-20-7	XYLENES, TOTAL	ug/l	N	5	U	5	U					5	U		
SW8270	120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	N	2	U	2	U					2	U		
SW8270	95-50-1	1,2-DICHLOROBENZENE	ug/l	N	2	U	2	U					2	U		
SW8270	541-73-1	1,3-DICHLOROBENZENE	ug/l	N	2	U	2	U					2	U		
SW8270	106-46-7	1,4-DICHLOROBENZENE	ug/l	N	2	U	2	U					2	U		
SW8270	83-32-9	ACENAPHTHENE	ug/l	N	0.5	U	0.5	U					0.5	U		
SW8270	120-12-7	ANTHRACENE	ug/l	N	0.5	U	0.5	U					0.5	U		
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/l	N	0.5	U	0.5	U					0.5	U		
SW8270	50-32-8	BENZO(A)PYRENE	ug/l	N	0.5	U	0.5	U					0.5	U		
SW8270	86-73-7	FLUORENE	ug/l	N	0.5	U	0.5	U					0.5	U		
SW8270	91-20-3	NAPHTHALENE	ug/l	N	0.5	U	0.5	U					0.5	U		
SW8270	85-01-8	PHENANTHRENE	ug/l	N	0.5	U	0.5	U					0.5	U		
SW8270	108-95-2	PHENOL	ug/l	N	2	U	2	U					2	U		
SW8270	129-00-0	PYRENE	ug/l	N	0.5	U	0.5	U					0.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
				Field Sample ID	OL-3140-04		OL-3141-04		OL-3140-05		OL-3141-05		OL-3140-06		OL-3141-06	
				Depth (ft)	0.66 - 0.66		0.33 - 0.33		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N			0.00009				0.000043	J			0.000111	
E1631	7439-97-6	MERCURY	ug/l	N			0.001				0.00088				0.00059	
E1631	7439-97-6	MERCURY	ug/l	Y			0.00026	J			0.00016	J			0.00018	J
E1668	33146-45-1	10-DiCB	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	74472-36-9	112-PeCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	41411-61-4	142-HxCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	68194-15-0	143-HxCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	41411-62-5	160-HxCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74472-43-8	161-HxCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	39635-34-2	162-HxCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74472-45-0	164-HxCB	pg/L	N	75.5	U			23.0	J			75.5	U		
E1668	74472-46-1	165-HxCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	52663-76-0	203-OcCB	pg/L	N	113	U			114	U			113	U		
E1668	52663-58-8	64-TeCB	pg/L	N	20.0	J			15.6	J			75.5	U		
E1668	41464-42-0	72-TeCB	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	31508-00-6	PCB 118	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	2051-24-3	PCB 209	pg/L	N	943	U			952	U			943	U		
E1668	35693-99-3	PCB 52	pg/L	N	52.1	J			46.4	J			34.7	J		
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	2051-60-7	PCB-1	pg/L	N	189	U			190	U			189	U		
E1668	60145-21-3	PCB-103	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	56558-16-8	PCB-104	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	32598-14-4	PCB-105	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	70424-69-0	PCB-106/118	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	70424-68-9	PCB-107	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB108+124	PCB-108/124	pg/L	N	151	U			152	U			151	U		
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N	453	U			457	U			453	U		
E1668	2050-67-1	PCB-11	pg/L	N	283	U			286	U			283	U		
E1668	39635-32-0	PCB-111	pg/L	N	75.5	UJ			76.2	UJ			75.5	UJ		
E1668	PCB11390101	PCB-113/90/101	pg/L	N	226	U			229	U			226	U		
E1668	74472-37-0	PCB-114	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB12+13	PCB-12/13	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	68194-12-7	PCB-120	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	56558-18-0	PCB-121	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	76842-07-4	PCB-122	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	65510-44-3	PCB-123	pg/L	N	75.5	U			15.8	J			75.5	U		
E1668	57465-28-8	PCB-126	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	39635-33-1	PCB-127	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB128+166	PCB-128/166	pg/L	N	151	U			152	U			151	U		
E1668	52663-66-8	PCB-130	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	61798-70-7	PCB-131	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	38380-05-1	PCB-132	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	35694-04-3	PCB-133	pg/L	N	75.5	U			76.2	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
				Field Sample ID	OL-3140-04		OL-3141-04		OL-3140-05		OL-3141-05		OL-3140-06		OL-3141-06	
				Depth (ft)	0.66 - 0.66		0.33 - 0.33		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52704-70-8	PCB-134	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	38411-22-2	PCB-136	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	35694-06-5	PCB-137	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB138163129	PCB-138/163/129	pg/L	N	226	U			229	U			226	U		
E1668	PCB139+140	PCB-139/140	pg/L	N	151	U			152	U			151	U		
E1668	34883-41-5	PCB-14	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	52712-04-6	PCB-141	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	68194-14-9	PCB-144	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74472-40-5	PCB-145	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	51908-16-8	PCB-146	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB147+149	PCB-147/149	pg/L	N	151	U			152	U			151	U		
E1668	74472-41-6	PCB-148	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	2050-68-2	PCB-15	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	68194-08-1	PCB-150	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB151+135	PCB-151/135	pg/L	N	151	U			152	U			151	U		
E1668	68194-09-2	PCB-152	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	38380-01-7	PCB-153	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB153+168	PCB-153/168	pg/L	N	151	U			152	U			151	U		
E1668	60145-22-4	PCB-154	pg/L	N	189	U			190	U			189	U		
E1668	33979-03-2	PCB-155	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB156+157	PCB-156/157	pg/L	N	151	U			152	U			151	U		
E1668	74472-42-7	PCB-158	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	39635-35-3	PCB-159	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	38444-78-9	PCB-16	pg/L	N	11.3	J			38.1	U			37.7	U		
E1668	52663-72-6	PCB-167	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	32774-16-6	PCB-169	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	37680-66-3	PCB-17	pg/L	N	9.0	J			16.0	J			12.4	J		
E1668	35065-30-6	PCB-170	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB171+173	PCB-171/173	pg/L	N	151	U			152	U			151	U		
E1668	52663-74-8	PCB-172	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	38411-25-5	PCB-174	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	40186-70-7	PCB-175	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	52663-65-7	PCB-176	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	52663-70-4	PCB-177	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	52663-67-9	PCB-178	pg/L	N	75.5	UJ			76.2	UJ			75.5	UJ		
E1668	52663-64-6	PCB-179	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB180+193	PCB-180/193	pg/L	N	151	U			152	U			151	U		
E1668	74472-47-2	PCB-181	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	60145-23-5	PCB-182	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	52663-68-0	PCB-183	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74472-48-3	PCB-184	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74472-49-4	PCB-186	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74487-85-7	PCB-188	pg/L	N	189	U			190	U			189	U		
E1668	39635-31-9	PCB-189	pg/L	N	75.5	U			76.2	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
				Field Sample ID	OL-3140-04		OL-3141-04		OL-3140-05		OL-3141-05		OL-3140-06		OL-3141-06	
				Depth (ft)	0.66 - 0.66		0.33 - 0.33		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-73-4	PCB-19	pg/L	N	37.70	U			38.10	U			37.70	U		
E1668	41411-64-7	PCB-190	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74472-50-7	PCB-191	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74472-51-8	PCB-192	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	35694-08-7	PCB-194	pg/L	N	113	U			114	U			113	U		
E1668	52663-78-2	PCB-195	pg/L	N	113	U			114	U			113	U		
E1668	42740-50-1	PCB-196/203	pg/L	N	113	U			114	U			113	U		
E1668	PCB198+199	PCB-198/199	pg/L	N	226	U			229	U			226	U		
E1668	2051-61-8	PCB-2	pg/L	N	189	U			190	U			189	U		
E1668	40186-71-8	PCB-201	pg/L	N	377	U			381	U			377	U		
E1668	2136-99-4	PCB-202	pg/L	N	113	U			114	U			113	U		
E1668	74472-52-9	PCB-204	pg/L	N	113	U			114	U			113	U		
E1668	74472-53-0	PCB-205	pg/L	N	113	U			114	U			113	U		
E1668	40186-72-9	PCB-206	pg/L	N	113	U			114	U			113	U		
E1668	52663-79-3	PCB-207	pg/L	N	113	U			114	U			113	U		
E1668	52663-77-1	PCB-208	pg/L	N	113	U			114	U			113	U		
E1668	PCB21+33	PCB-21/33	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	38444-85-8	PCB-22	pg/L	N	37.70	U			38.10	U			37.70	U		
E1668	55720-44-0	PCB-23	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	55702-45-9	PCB-24	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	55712-37-3	PCB-25	pg/L	N	37.70	U			7.81	J			37.70	U		
E1668	38444-76-7	PCB-27	pg/L	N	37.70	U			6.40	J			5.14	J		
E1668	PCB28+20	PCB-28/20	pg/L	N	28.4	J			23.4	J			17.7	J		
E1668	PCB29+26	PCB-29/26	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	2051-62-9	PCB-3	pg/L	N	189	U			190	U			189	U		
E1668	16606-02-3	PCB-31	pg/L	N	28.2	J			30.2	J			21.8	J		
E1668	38444-77-8	PCB-32	pg/L	N	6.0	J			11.4	J			7.9	J		
E1668	37680-68-5	PCB-34	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	37680-69-6	PCB-35	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	38444-87-0	PCB-36	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	38444-90-5	PCB-37	pg/L	N	6.8	J			38.1	U			37.7	U		
E1668	53555-66-1	PCB-38	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	38444-88-1	PCB-39	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	13029-08-8	PCB-4	pg/L	N	12.6	J			38.1	U			37.7	U		
E1668	52663-59-9	PCB-41	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	36559-22-5	PCB-42	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	70362-46-8	PCB-43	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N	40.4	J			39.9	J			226.0	U		
E1668	70362-45-7	PCB-45	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	41464-47-5	PCB-46	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	70362-47-9	PCB-48	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	16605-91-7	PCB-5	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	PCB50+53	PCB-50/53	pg/L	N	283	U			286	U			283	U		
E1668	68194-04-7	PCB-51	pg/L	N	75.5	U			76.2	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
				Field Sample ID	OL-3140-04		OL-3141-04		OL-3140-05		OL-3141-05		OL-3140-06		OL-3141-06	
				Depth (ft)	0.66 - 0.66		0.33 - 0.33		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	15968-05-5	PCB-54	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	74338-24-2	PCB-55	pg/L	N	14.3	J			76.2	U			75.5	U		
E1668	41464-43-1	PCB-56	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	70424-67-8	PCB-57	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	41464-49-7	PCB-58	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N	226	U			229	U			226	U		
E1668	25569-80-6	PCB-6	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N	50.4	J			305	U			302	U		
E1668	74472-34-7	PCB-63	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	32598-10-0	PCB-66	pg/L	N	28.0	J			16.6	J			12.1	J		
E1668	73575-53-8	PCB-67	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	73575-52-7	PCB-68	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB69+49	PCB-69/49	pg/L	N	25.4	J			26.9	J			151.0	U		
E1668	33284-50-3	PCB-7	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	74338-23-1	PCB-73	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	32598-13-3	PCB-77	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	70362-49-1	PCB-78	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	41464-48-6	PCB-79	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	34883-43-7	PCB-8	pg/L	N	37.7	U			38.1	U			15.3	J		
E1668	33284-52-5	PCB-80	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	70362-50-4	PCB-81	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	52663-62-4	PCB-82	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	60145-20-2	PCB-83	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	52663-60-2	PCB-84	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	55215-17-3	PCB-88	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	73575-57-2	PCB-89	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	34883-39-1	PCB-9	pg/L	N	37.7	U			38.1	U			37.7	U		
E1668	52663-61-3	PCB-92	pg/L	N	75.5	U			23.2	J			75.5	U		
E1668	73575-55-0	PCB-94	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	38379-99-6	PCB-95	pg/L	N	75.5	U			76.2	U			19.0	J		
E1668	73575-54-9	PCB-96	pg/L	N	75.5	U			76.2	U			75.5	U		
E1668	PCB110+115	PCB110+115	pg/L	N	151	U			152	U			151	U		
E1668	PCB18+30	PCB18+30	pg/L	N	25.1	J			29.7	J			22.5	J		
E1668	PCB183+185	PCB183+185	pg/L	N	151	U			152	U			151	U		
E1668	PCB197+200	PCB197+200	pg/L	N	226	U			229	U			226	U		
E1668	PCB40+71	PCB40+71	pg/L	N	151	U			152	U			151	U		
E1668	PCB85116117	PCB85+116+117	pg/L	N	226	U			229	U			226	U		
E1668	PCB93+100	PCB93+100	pg/L	N	151	U			152	U			151	U		
E1668	PCB98+102	PCB98+102	pg/L	N	189	U			190	U			189	U		
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	N	5	U			5	U			5	U		
SW8260	108-70-3	1,3,5-TRICHLOROBENZENE	ug/l	N	5	U			5	U			5	U		
SW8260	71-43-2	BENZENE	ug/l	N	0.2	J			1	U			1	U		
SW8260	108-90-7	CHLOROBENZENE	ug/l	N	0.3	J			1	U			1	U		
SW8260	100-41-4	ETHYLBENZENE	ug/l	N	1	U			1	U			1	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
				Field Sample ID	OL-3140-04		OL-3141-04		OL-3140-05		OL-3141-05		OL-3140-06		OL-3141-06	
				Depth (ft)	0.66 - 0.66		0.33 - 0.33		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
SW8260	95-47-6	O-XYLENE	ug/l	N	1	U			1	U			1	U		
SW8260	108-88-3	TOLUENE	ug/l	N	1	U			1	U			1	U		
SW8260	1330-20-7	XYLENES, TOTAL	ug/l	N	5	U			5	U			5	U		
SW8270	120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	95-50-1	1,2-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	541-73-1	1,3-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	106-46-7	1,4-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	83-32-9	ACENAPHTHENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	120-12-7	ANTHRACENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	50-32-8	BENZO(A)PYRENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	86-73-7	FLUORENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	91-20-3	NAPHTHALENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	85-01-8	PHENANTHRENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	108-95-2	PHENOL	ug/l	N	2	U			2	U			2	U		
SW8270	129-00-0	PYRENE	ug/l	N	0.5	U			0.5	U			0.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
				Field Sample ID	OL-3140-07		OL-3141-07		OL-3140-08		OL-3141-08		OL-3140-09		OL-3141-09	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N			0.000026	U			0.00007				0.000047	J
E1631	7439-97-6	MERCURY	ug/l	N			0.00044	J			0.00066				0.00077	
E1631	7439-97-6	MERCURY	ug/l	Y			0.00016	J			0.00026	J			0.0002	J
E1668	33146-45-1	10-DiCB	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	74472-36-9	112-PeCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	41411-61-4	142-HxCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	68194-15-0	143-HxCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	41411-62-5	160-HxCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74472-43-8	161-HxCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	39635-34-2	162-HxCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74472-45-0	164-HxCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74472-46-1	165-HxCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N	76.2	U			75.5	U			12.9	J		
E1668	52663-76-0	203-OcCB	pg/L	N	114	U			60.8	J			113	U		
E1668	52663-58-8	64-TeCB	pg/L	N	13.6	J			26.6	J			75.5	U		
E1668	41464-42-0	72-TeCB	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	31508-00-6	PCB 118	pg/L	N	14.5	J			31.6	J			75.5	U		
E1668	2051-24-3	PCB 209	pg/L	N	952	U			943	U			943	U		
E1668	35693-99-3	PCB 52	pg/L	N	48.0	J			69.2	J			75.5	U		
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	2051-60-7	PCB-1	pg/L	N	190	U			189	U			189	U		
E1668	60145-21-3	PCB-103	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	56558-16-8	PCB-104	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	32598-14-4	PCB-105	pg/L	N	76.2	U			16.5	J			75.5	U		
E1668	70424-69-0	PCB-106/118	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	70424-68-9	PCB-107	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB108+124	PCB-108/124	pg/L	N	152	U			151	U			151	U		
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N	457	U			453	U			453	U		
E1668	2050-67-1	PCB-11	pg/L	N	286	U			283	U			283	U		
E1668	39635-32-0	PCB-111	pg/L	N	76.2	UJ			75.5	UJ			75.5	U		
E1668	PCB11390101	PCB-113/90/101	pg/L	N	229	U			43.2	J			226	U		
E1668	74472-37-0	PCB-114	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB12+13	PCB-12/13	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	68194-12-7	PCB-120	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	56558-18-0	PCB-121	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	76842-07-4	PCB-122	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	65510-44-3	PCB-123	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	57465-28-8	PCB-126	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	39635-33-1	PCB-127	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB128+166	PCB-128/166	pg/L	N	152	U			151	U			151	U		
E1668	52663-66-8	PCB-130	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	61798-70-7	PCB-131	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	38380-05-1	PCB-132	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	35694-04-3	PCB-133	pg/L	N	76.2	U			75.5	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
				Field Sample ID	OL-3140-07		OL-3141-07		OL-3140-08		OL-3141-08		OL-3140-09		OL-3141-09	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52704-70-8	PCB-134	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	38411-22-2	PCB-136	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	35694-06-5	PCB-137	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB138163129	PCB-138/163/129	pg/L	N	229	U			50.5	J			226	U		
E1668	PCB139+140	PCB-139/140	pg/L	N	152	U			151	U			151	U		
E1668	34883-41-5	PCB-14	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	52712-04-6	PCB-141	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	68194-14-9	PCB-144	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74472-40-5	PCB-145	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	51908-16-8	PCB-146	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB147+149	PCB-147/149	pg/L	N	152	U			28.4	J			151	U		
E1668	74472-41-6	PCB-148	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	2050-68-2	PCB-15	pg/L	N	38.1	U			37.7	U			9.5	J		
E1668	68194-08-1	PCB-150	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB151+135	PCB-151/135	pg/L	N	152	U			151	U			151	U		
E1668	68194-09-2	PCB-152	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	38380-01-7	PCB-153	pg/L	N	76.2	U			22.2	J			75.5	U		
E1668	PCB153+168	PCB-153/168	pg/L	N	152	U			35.3	J			151	U		
E1668	60145-22-4	PCB-154	pg/L	N	190	U			189	U			189	U		
E1668	33979-03-2	PCB-155	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB156+157	PCB-156/157	pg/L	N	152	U			151	U			151	U		
E1668	74472-42-7	PCB-158	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	39635-35-3	PCB-159	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	38444-78-9	PCB-16	pg/L	N	38.1	U			11.4	J			37.7	U		
E1668	52663-72-6	PCB-167	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	32774-16-6	PCB-169	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	37680-66-3	PCB-17	pg/L	N	21.4	J			15.7	J			37.7	U		
E1668	35065-30-6	PCB-170	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB171+173	PCB-171/173	pg/L	N	152	U			151	U			151	U		
E1668	52663-74-8	PCB-172	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	38411-25-5	PCB-174	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	40186-70-7	PCB-175	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	52663-65-7	PCB-176	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	52663-70-4	PCB-177	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	52663-67-9	PCB-178	pg/L	N	76.2	UJ			75.5	UJ			75.5	U		
E1668	52663-64-6	PCB-179	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB180+193	PCB-180/193	pg/L	N	152	U			59.1	J			151	U		
E1668	74472-47-2	PCB-181	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	60145-23-5	PCB-182	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	52663-68-0	PCB-183	pg/L	N	76.2	U			39.8	J			75.5	U		
E1668	74472-48-3	PCB-184	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74472-49-4	PCB-186	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74487-85-7	PCB-188	pg/L	N	190	U			189	U			189	U		
E1668	39635-31-9	PCB-189	pg/L	N	76.2	U			75.5	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
				Field Sample ID	OL-3140-07		OL-3141-07		OL-3140-08		OL-3141-08		OL-3140-09		OL-3141-09	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-73-4	PCB-19	pg/L	N	9.97	J			10.40	J			9.72	J		
E1668	41411-64-7	PCB-190	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74472-50-7	PCB-191	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	74472-51-8	PCB-192	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	35694-08-7	PCB-194	pg/L	N	114	U			57.3	J			113	U		
E1668	52663-78-2	PCB-195	pg/L	N	114	U			113	U			113	U		
E1668	42740-50-1	PCB-196/203	pg/L	N	114	U			23.2	J			113	U		
E1668	PCB198+199	PCB-198/199	pg/L	N	229	U			80.4	J			226	U		
E1668	2051-61-8	PCB-2	pg/L	N	190	U			189	U			189	U		
E1668	40186-71-8	PCB-201	pg/L	N	381	U			377	U			377	U		
E1668	2136-99-4	PCB-202	pg/L	N	114	U			113	U			113	U		
E1668	74472-52-9	PCB-204	pg/L	N	114	U			113	U			113	U		
E1668	74472-53-0	PCB-205	pg/L	N	114	U			113	U			113	U		
E1668	40186-72-9	PCB-206	pg/L	N	114	U			97.2	J			113	U		
E1668	52663-79-3	PCB-207	pg/L	N	114	U			113	U			113	U		
E1668	52663-77-1	PCB-208	pg/L	N	114	U			113	U			113	U		
E1668	PCB21+33	PCB-21/33	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	38444-85-8	PCB-22	pg/L	N	8.06	J			37.70	U			37.70	U		
E1668	55720-44-0	PCB-23	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	55702-45-9	PCB-24	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	55712-37-3	PCB-25	pg/L	N	10.30	J			10.30	J			10.40	J		
E1668	38444-76-7	PCB-27	pg/L	N	9.35	J			6.40	J			6.48	J		
E1668	PCB28+20	PCB-28/20	pg/L	N	28.8	J			75.5	U			75.5	U		
E1668	PCB29+26	PCB-29/26	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	2051-62-9	PCB-3	pg/L	N	190	U			189	U			189	U		
E1668	16606-02-3	PCB-31	pg/L	N	33.1	J			33.3	J			42.6			
E1668	38444-77-8	PCB-32	pg/L	N	14.7	J			12.5	J			37.7	U		
E1668	37680-68-5	PCB-34	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	37680-69-6	PCB-35	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	38444-87-0	PCB-36	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	38444-90-5	PCB-37	pg/L	N	7.0	J			5.7	J			6.5	J		
E1668	53555-66-1	PCB-38	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	38444-88-1	PCB-39	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	13029-08-8	PCB-4	pg/L	N	38.1	U			37.7	U			26.9	J		
E1668	52663-59-9	PCB-41	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	36559-22-5	PCB-42	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	70362-46-8	PCB-43	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N	42.2	J			54.4	J			226.0	U		
E1668	70362-45-7	PCB-45	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	41464-47-5	PCB-46	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	70362-47-9	PCB-48	pg/L	N	76.2	U			75.5	U			75.5	U		
E1668	16605-91-7	PCB-5	pg/L	N	38.1	U			37.7	U			37.7	U		
E1668	PCB50+53	PCB-50/53	pg/L	N	286	U			283	U			283	U		
E1668	68194-04-7	PCB-51	pg/L	N	76.2	U			75.5	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAC-SW-01	OL-RAC-SW-01	OL-RAC-SW-02	OL-RAC-SW-02	OL-RAD-SW-01	OL-RAD-SW-01
				Field Sample ID	OL-3140-07	OL-3141-07	OL-3140-08	OL-3141-08	OL-3140-09	OL-3141-09
				Depth (ft)	1.65 - 1.65	1.65 - 1.65	1.65 - 1.65	1.65 - 1.65	1.65 - 1.65	1.65 - 1.65
				Date Sampled	09/14/2018	09/20/2018	09/14/2018	09/20/2018	09/14/2018	09/20/2018
				SDG	ONO67	8I00663	ONO67	8I00663	ONO67	8I00663
				Matrix	WATER	WATER	WATER	WATER	WATER	WATER
				Purpose	REG	REG	REG	REG	REG	REG
				Type	W-SW	W-SW	W-SW	W-SW	W-SW	W-SW
Method	Parameter Code	Parameter Name	Units	Filtered						
E1668	15968-05-5	PCB-54	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	74338-24-2	PCB-55	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	41464-43-1	PCB-56	pg/L	N	76.2 U		17.4 J		75.5 U	
E1668	70424-67-8	PCB-57	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	41464-49-7	PCB-58	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N	229 U		226 U		226 U	
E1668	25569-80-6	PCB-6	pg/L	N	38.1 U		37.7 U		37.7 U	
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N	305 U		45.4 J		302 U	
E1668	74472-34-7	PCB-63	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	32598-10-0	PCB-66	pg/L	N	15.5 J		32.1 J		75.5 U	
E1668	73575-53-8	PCB-67	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	73575-52-7	PCB-68	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	PCB69+49	PCB-69/49	pg/L	N	31.7 J		36.7 J		151.0 U	
E1668	33284-50-3	PCB-7	pg/L	N	38.1 U		37.7 U		37.7 U	
E1668	74338-23-1	PCB-73	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	32598-13-3	PCB-77	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	70362-49-1	PCB-78	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	41464-48-6	PCB-79	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	34883-43-7	PCB-8	pg/L	N	38.1 U		13.8 J		37.7 U	
E1668	33284-52-5	PCB-80	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	70362-50-4	PCB-81	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	52663-62-4	PCB-82	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	60145-20-2	PCB-83	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	52663-60-2	PCB-84	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	55215-17-3	PCB-88	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	73575-57-2	PCB-89	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	34883-39-1	PCB-9	pg/L	N	38.1 U		37.7 U		37.7 U	
E1668	52663-61-3	PCB-92	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	73575-55-0	PCB-94	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	38379-99-6	PCB-95	pg/L	N	22.1 J		34.9 J		75.5 U	
E1668	73575-54-9	PCB-96	pg/L	N	76.2 U		75.5 U		75.5 U	
E1668	PCB110+115	PCB110+115	pg/L	N	152 U		58.5 J		151 U	
E1668	PCB18+30	PCB18+30	pg/L	N	34.2 J		28.6 J		75.5 U	
E1668	PCB183+185	PCB183+185	pg/L	N	152 U		151 U		151 U	
E1668	PCB197+200	PCB197+200	pg/L	N	229 U		226 U		226 U	
E1668	PCB40+71	PCB40+71	pg/L	N	152 U		22.9 J		151 U	
E1668	PCB85116117	PCB85+116+117	pg/L	N	229 U		226 U		226 U	
E1668	PCB93+100	PCB93+100	pg/L	N	152 U		151 U		151 U	
E1668	PCB98+102	PCB98+102	pg/L	N	190 U		189 U		189 U	
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	N	5 U		5 U		5 U	
SW8260	108-70-3	1,3,5-TRICHLOROBENZENE	ug/l	N	5 U		5 U		5 U	
SW8260	71-43-2	BENZENE	ug/l	N	1 U		1 U		1 U	
SW8260	108-90-7	CHLOROBENZENE	ug/l	N	1 U		1 U		1 U	
SW8260	100-41-4	ETHYLBENZENE	ug/l	N	1 U		1 U		1 U	

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
				Field Sample ID	OL-3140-07		OL-3141-07		OL-3140-08		OL-3141-08		OL-3140-09		OL-3141-09	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
SW8260	95-47-6	O-XYLENE	ug/l	N	1	U			1	U			1	U		
SW8260	108-88-3	TOLUENE	ug/l	N	1	U			1	U			1	U		
SW8260	1330-20-7	XYLENES, TOTAL	ug/l	N	5	U			5	U			5	U		
SW8270	120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	95-50-1	1,2-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	541-73-1	1,3-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	106-46-7	1,4-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	83-32-9	ACENAPHTHENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	120-12-7	ANTHRACENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	50-32-8	BENZO(A)PYRENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	86-73-7	FLUORENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	91-20-3	NAPHTHALENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	85-01-8	PHENANTHRENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	108-95-2	PHENOL	ug/l	N	2	U			2	U			2	U		
SW8270	129-00-0	PYRENE	ug/l	N	0.5	U			0.5	U			0.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
				Field Sample ID	OL-3140-10		OL-3141-10		OL-3140-11		OL-3141-11		OL-3140-12		OL-3141-12	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.66 - 0.66		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N			0.000029	J			0.000154				0.000083	
E1631	7439-97-6	MERCURY	ug/l	N			0.00104				0.0018				0.00134	
E1631	7439-97-6	MERCURY	ug/l	Y			0.00015	J			0.00034	J			0.00019	J
E1668	33146-45-1	10-DiCB	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	74472-36-9	112-PeCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	41411-61-4	142-HxCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	68194-15-0	143-HxCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	41411-62-5	160-HxCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74472-43-8	161-HxCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	39635-34-2	162-HxCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74472-45-0	164-HxCB	pg/L	N	76.2	U			76.2	U			26.3	J		
E1668	74472-46-1	165-HxCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N	15.6	J			76.2	U			75.5	U		
E1668	52663-76-0	203-OcCB	pg/L	N	114	U			114	U			113	U		
E1668	52663-58-8	64-TeCB	pg/L	N	76.2	U			24.2	J			28.9	J		
E1668	41464-42-0	72-TeCB	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	31508-00-6	PCB 118	pg/L	N	76.2	U			26.6	J			26.5	J		
E1668	2051-24-3	PCB 209	pg/L	N	952	U			952	U			943	U		
E1668	35693-99-3	PCB 52	pg/L	N	76.2	U			68.3	J			98.3			
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	2051-60-7	PCB-1	pg/L	N	190	U			190	U			189	U		
E1668	60145-21-3	PCB-103	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	56558-16-8	PCB-104	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	32598-14-4	PCB-105	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	70424-69-0	PCB-106/118	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	70424-68-9	PCB-107	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB108+124	PCB-108/124	pg/L	N	152	U			152	U			151	U		
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N	457	U			457	U			453	U		
E1668	2050-67-1	PCB-11	pg/L	N	286	U			286	U			283	U		
E1668	39635-32-0	PCB-111	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB11390101	PCB-113/90/101	pg/L	N	229	U			39.4	J			226	U		
E1668	74472-37-0	PCB-114	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB12+13	PCB-12/13	pg/L	N	76.2	U			39.2	J			75.5	U		
E1668	68194-12-7	PCB-120	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	56558-18-0	PCB-121	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	76842-07-4	PCB-122	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	65510-44-3	PCB-123	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	57465-28-8	PCB-126	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	39635-33-1	PCB-127	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB128+166	PCB-128/166	pg/L	N	152	U			152	U			151	U		
E1668	52663-66-8	PCB-130	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	61798-70-7	PCB-131	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	38380-05-1	PCB-132	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	35694-04-3	PCB-133	pg/L	N	76.2	U			76.2	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
				Field Sample ID	OL-3140-10		OL-3141-10		OL-3140-11		OL-3141-11		OL-3140-12		OL-3141-12	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.66 - 0.66		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52704-70-8	PCB-134	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	38411-22-2	PCB-136	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	35694-06-5	PCB-137	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB138163129	PCB-138/163/129	pg/L	N	229	U			49.8	J			226	U		
E1668	PCB139+140	PCB-139/140	pg/L	N	152	U			152	U			151	U		
E1668	34883-41-5	PCB-14	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	52712-04-6	PCB-141	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	68194-14-9	PCB-144	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74472-40-5	PCB-145	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	51908-16-8	PCB-146	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB147+149	PCB-147/149	pg/L	N	152	U			34.9	J			151	U		
E1668	74472-41-6	PCB-148	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	2050-68-2	PCB-15	pg/L	N	16.2	J			46.7				37.7	U		
E1668	68194-08-1	PCB-150	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB151+135	PCB-151/135	pg/L	N	152	U			152	U			151	U		
E1668	68194-09-2	PCB-152	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	38380-01-7	PCB-153	pg/L	N	76.2	U			17.3	J			75.5	U		
E1668	PCB153+168	PCB-153/168	pg/L	N	152	U			36.3	J			151	U		
E1668	60145-22-4	PCB-154	pg/L	N	190	U			190	U			189	U		
E1668	33979-03-2	PCB-155	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB156+157	PCB-156/157	pg/L	N	152	U			152	U			151	U		
E1668	74472-42-7	PCB-158	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	39635-35-3	PCB-159	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	38444-78-9	PCB-16	pg/L	N	38.1	U			31.7	J			18.3	J		
E1668	52663-72-6	PCB-167	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	32774-16-6	PCB-169	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	37680-66-3	PCB-17	pg/L	N	38.1	U			29.2	J			33.4	J		
E1668	35065-30-6	PCB-170	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB171+173	PCB-171/173	pg/L	N	152	U			152	U			151	U		
E1668	52663-74-8	PCB-172	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	38411-25-5	PCB-174	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	40186-70-7	PCB-175	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	52663-65-7	PCB-176	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	52663-70-4	PCB-177	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	52663-67-9	PCB-178	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	52663-64-6	PCB-179	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB180+193	PCB-180/193	pg/L	N	152	U			31	J			151	U		
E1668	74472-47-2	PCB-181	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	60145-23-5	PCB-182	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	52663-68-0	PCB-183	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74472-48-3	PCB-184	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74472-49-4	PCB-186	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74487-85-7	PCB-188	pg/L	N	190	U			190	U			189	U		
E1668	39635-31-9	PCB-189	pg/L	N	76.2	U			76.2	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
				Field Sample ID	OL-3140-10		OL-3141-10		OL-3140-11		OL-3141-11		OL-3140-12		OL-3141-12	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.66 - 0.66		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-73-4	PCB-19	pg/L	N	14.60	J			38.10	U			17.70	J		
E1668	41411-64-7	PCB-190	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74472-50-7	PCB-191	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74472-51-8	PCB-192	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	35694-08-7	PCB-194	pg/L	N	114	U			114	U			113	U		
E1668	52663-78-2	PCB-195	pg/L	N	114	U			114	U			113	U		
E1668	42740-50-1	PCB-196/203	pg/L	N	114	U			114	U			113	U		
E1668	PCB198+199	PCB-198/199	pg/L	N	229	U			229	U			226	U		
E1668	2051-61-8	PCB-2	pg/L	N	190	U			190	U			189	U		
E1668	40186-71-8	PCB-201	pg/L	N	381	U			381	U			377	U		
E1668	2136-99-4	PCB-202	pg/L	N	114	U			114	U			113	U		
E1668	74472-52-9	PCB-204	pg/L	N	114	U			114	U			113	U		
E1668	74472-53-0	PCB-205	pg/L	N	114	U			114	U			113	U		
E1668	40186-72-9	PCB-206	pg/L	N	114	U			114	U			113	U		
E1668	52663-79-3	PCB-207	pg/L	N	114	U			114	U			113	U		
E1668	52663-77-1	PCB-208	pg/L	N	114	U			114	U			113	U		
E1668	PCB21+33	PCB-21/33	pg/L	N	11.9	J			30.3	J			75.5	U		
E1668	38444-85-8	PCB-22	pg/L	N	38.10	U			23.20	J			13.60	J		
E1668	55720-44-0	PCB-23	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	55702-45-9	PCB-24	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	55712-37-3	PCB-25	pg/L	N	15.20	J			8.83	J			23.40	J		
E1668	38444-76-7	PCB-27	pg/L	N	9.05	J			6.10	J			12.10	J		
E1668	PCB28+20	PCB-28/20	pg/L	N	76.2	U			69.4	J			56.3	J		
E1668	PCB29+26	PCB-29/26	pg/L	N	76.2	U			76.2	U			38.1	J		
E1668	2051-62-9	PCB-3	pg/L	N	190	U			190	U			189	U		
E1668	16606-02-3	PCB-31	pg/L	N	54.7				102.0				67.7			
E1668	38444-77-8	PCB-32	pg/L	N	38.1	U			22.4	J			21.9	J		
E1668	37680-68-5	PCB-34	pg/L	N	38.1	U			6.9	J			37.7	U		
E1668	37680-69-6	PCB-35	pg/L	N	38.1	U			5.2	J			37.7	U		
E1668	38444-87-0	PCB-36	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	38444-90-5	PCB-37	pg/L	N	7.8	J			24.3	J			7.7	J		
E1668	53555-66-1	PCB-38	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	38444-88-1	PCB-39	pg/L	N	38.1	U			8.3	J			37.7	U		
E1668	13029-08-8	PCB-4	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	52663-59-9	PCB-41	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	36559-22-5	PCB-42	pg/L	N	76.2	U			76.2	U			25.7	J		
E1668	70362-46-8	PCB-43	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N	229.0	U			54.1	J			82.4	J		
E1668	70362-45-7	PCB-45	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	41464-47-5	PCB-46	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	70362-47-9	PCB-48	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	16605-91-7	PCB-5	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	PCB50+53	PCB-50/53	pg/L	N	286	U			286	U			283	U		
E1668	68194-04-7	PCB-51	pg/L	N	76.2	U			76.2	U			75.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
				Field Sample ID	OL-3140-10		OL-3141-10		OL-3140-11		OL-3141-11		OL-3140-12		OL-3141-12	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.66 - 0.66		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	15968-05-5	PCB-54	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	74338-24-2	PCB-55	pg/L	N	76.2	U			76.2	U			19.1	J		
E1668	41464-43-1	PCB-56	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	70424-67-8	PCB-57	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	41464-49-7	PCB-58	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N	229	U			229	U			226	U		
E1668	25569-80-6	PCB-6	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N	305	U			58.3	J			59.3	J		
E1668	74472-34-7	PCB-63	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	32598-10-0	PCB-66	pg/L	N	76.2	U			26.1	J			35.9	J		
E1668	73575-53-8	PCB-67	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	73575-52-7	PCB-68	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB69+49	PCB-69/49	pg/L	N	152.0	U			34.1	J			67.4	J		
E1668	33284-50-3	PCB-7	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	74338-23-1	PCB-73	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	32598-13-3	PCB-77	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	70362-49-1	PCB-78	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	41464-48-6	PCB-79	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	34883-43-7	PCB-8	pg/L	N	38.1	U			31.6	J			22.2	J		
E1668	33284-52-5	PCB-80	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	70362-50-4	PCB-81	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	52663-62-4	PCB-82	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	60145-20-2	PCB-83	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	52663-60-2	PCB-84	pg/L	N	76.2	U			12.0	J			75.5	U		
E1668	55215-17-3	PCB-88	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	73575-57-2	PCB-89	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	34883-39-1	PCB-9	pg/L	N	38.1	U			38.1	U			37.7	U		
E1668	52663-61-3	PCB-92	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	73575-55-0	PCB-94	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	38379-99-6	PCB-95	pg/L	N	76.2	U			44.3	J			37.2	J		
E1668	73575-54-9	PCB-96	pg/L	N	76.2	U			76.2	U			75.5	U		
E1668	PCB110+115	PCB110+115	pg/L	N	152	U			152	U			151	U		
E1668	PCB18+30	PCB18+30	pg/L	N	76.2	U			73.5	J			60.8	J		
E1668	PCB183+185	PCB183+185	pg/L	N	152	U			152	U			151	U		
E1668	PCB197+200	PCB197+200	pg/L	N	229	U			229	U			226	U		
E1668	PCB40+71	PCB40+71	pg/L	N	152	U			20.3	J			151	U		
E1668	PCB85116117	PCB85+116+117	pg/L	N	229	U			229	U			226	U		
E1668	PCB93+100	PCB93+100	pg/L	N	152	U			152	U			151	U		
E1668	PCB98+102	PCB98+102	pg/L	N	190	U			190	U			189	U		
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	N	5	U			5	U			5	U		
SW8260	108-70-3	1,3,5-TRICHLOROBENZENE	ug/l	N	5	U			5	U			5	U		
SW8260	71-43-2	BENZENE	ug/l	N	1	U			1	U			1	U		
SW8260	108-90-7	CHLOROBENZENE	ug/l	N	1	U			1	U			1	U		
SW8260	100-41-4	ETHYLBENZENE	ug/l	N	1	U			1	U			1	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
				Field Sample ID	OL-3140-10		OL-3141-10		OL-3140-11		OL-3141-11		OL-3140-12		OL-3141-12	
				Depth (ft)	1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.66 - 0.66		1.65 - 1.65		1.65 - 1.65	
				Date Sampled	09/14/2018		09/20/2018		09/14/2018		09/20/2018		09/14/2018		09/20/2018	
				SDG	ONO67		8I00663		ONO67		8I00663		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		REG		REG		REG		REG	
				Type	W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
SW8260	95-47-6	O-XYLENE	ug/l	N	1	U			1	U			1	U		
SW8260	108-88-3	TOLUENE	ug/l	N	1	U			0.3	J			1	U		
SW8260	1330-20-7	XYLENES, TOTAL	ug/l	N	5	U			5	U			5	U		
SW8270	120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	95-50-1	1,2-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	541-73-1	1,3-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	106-46-7	1,4-DICHLOROBENZENE	ug/l	N	2	U			2	U			2	U		
SW8270	83-32-9	ACENAPHTHENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	120-12-7	ANTHRACENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	50-32-8	BENZO(A)PYRENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	86-73-7	FLUORENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	91-20-3	NAPHTHALENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	85-01-8	PHENANTHRENE	ug/l	N	0.5	U			0.5	U			0.5	U		
SW8270	108-95-2	PHENOL	ug/l	N	2	U			2	U			2	U		
SW8270	129-00-0	PYRENE	ug/l	N	0.5	U			0.5	U			0.5	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3140-13		OL-3141-13		OL-3023-EB1		OL-3023-EB1		OL-3023-EB2		OL-3023-EB2	
				Depth (ft)	2.31 - 2.31		1.65 - 1.65									
				Date Sampled	09/14/2018		09/20/2018		09/13/2018		09/13/2018		09/13/2018		09/13/2018	
				SDG	ONO67		8I00663		8I00450		ONO68		8I00450		ONO68	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		EB		EB		EB		EB	
				Type	W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N			0.000064		0.000026	U			0.000026	U		
E1631	7439-97-6	MERCURY	ug/l	N			0.00064		0.00089				0.00051			
E1631	7439-97-6	MERCURY	ug/l	Y			0.00022	J								
E1668	33146-45-1	10-DiCB	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	74472-36-9	112-PeCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	41411-61-4	142-HxCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	68194-15-0	143-HxCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	41411-62-5	160-HxCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-43-8	161-HxCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	39635-34-2	162-HxCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-45-0	164-HxCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-46-1	165-HxCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-76-0	203-OcCB	pg/L	N	113	U					125	U			113	U
E1668	52663-58-8	64-TeCB	pg/L	N	77.1						83.1	U			75.5	U
E1668	41464-42-0	72-TeCB	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	31508-00-6	PCB 118	pg/L	N	48.8	J					83.1	U			75.5	U
E1668	2051-24-3	PCB 209	pg/L	N	943	U					1040	U			943	U
E1668	35693-99-3	PCB 52	pg/L	N	265.0						22.8	J			75.5	U
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N	18.8	J					83.1	U			75.5	U
E1668	2051-60-7	PCB-1	pg/L	N	189	U					208	U			189	U
E1668	60145-21-3	PCB-103	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	56558-16-8	PCB-104	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	32598-14-4	PCB-105	pg/L	N	21.8	J					83.1	U			75.5	U
E1668	70424-69-0	PCB-106/118	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	70424-68-9	PCB-107	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB108+124	PCB-108/124	pg/L	N	151	U					166	U			151	U
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N	453	U					498	U			453	U
E1668	2050-67-1	PCB-11	pg/L	N	283	U					312	U			283	U
E1668	39635-32-0	PCB-111	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB11390101	PCB-113/90/101	pg/L	N	226	U					249	U			226	U
E1668	74472-37-0	PCB-114	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB12+13	PCB-12/13	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	68194-12-7	PCB-120	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	56558-18-0	PCB-121	pg/L	N	14.8	J					83.1	U			75.5	U
E1668	76842-07-4	PCB-122	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	65510-44-3	PCB-123	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	57465-28-8	PCB-126	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	39635-33-1	PCB-127	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB128+166	PCB-128/166	pg/L	N	151	U					166	U			151	U
E1668	52663-66-8	PCB-130	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	61798-70-7	PCB-131	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	38380-05-1	PCB-132	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	35694-04-3	PCB-133	pg/L	N	75.5	U					83.1	U			75.5	U

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3140-13		OL-3141-13		OL-3023-EB1		OL-3023-EB1		OL-3023-EB2		OL-3023-EB2	
				Depth (ft)	2.31 - 2.31		1.65 - 1.65									
				Date Sampled	09/14/2018		09/20/2018		09/13/2018		09/13/2018		09/13/2018		09/13/2018	
				SDG	ONO67		8I00663		8I00450		ONO68		8I00450		ONO68	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		EB		EB		EB		EB	
				Type	W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52704-70-8	PCB-134	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	38411-22-2	PCB-136	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	35694-06-5	PCB-137	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB138163129	PCB-138/163/129	pg/L	N	56.5	J					249	U			226	U
E1668	PCB139+140	PCB-139/140	pg/L	N	151	U					166	U			151	U
E1668	34883-41-5	PCB-14	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	52712-04-6	PCB-141	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	68194-14-9	PCB-144	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-40-5	PCB-145	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	51908-16-8	PCB-146	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB147+149	PCB-147/149	pg/L	N	37.4	J					166	U			151	U
E1668	74472-41-6	PCB-148	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	2050-68-2	PCB-15	pg/L	N	55.3						41.5	U			37.7	U
E1668	68194-08-1	PCB-150	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB151+135	PCB-151/135	pg/L	N	151	U					166	U			151	U
E1668	68194-09-2	PCB-152	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	38380-01-7	PCB-153	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB153+168	PCB-153/168	pg/L	N	151	U					166	U			151	U
E1668	60145-22-4	PCB-154	pg/L	N	189	U					208	U			189	U
E1668	33979-03-2	PCB-155	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB156+157	PCB-156/157	pg/L	N	151	U					166	U			151	U
E1668	74472-42-7	PCB-158	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	39635-35-3	PCB-159	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	38444-78-9	PCB-16	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	52663-72-6	PCB-167	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	32774-16-6	PCB-169	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	37680-66-3	PCB-17	pg/L	N	93.1						41.5	U			37.7	U
E1668	35065-30-6	PCB-170	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB171+173	PCB-171/173	pg/L	N	151	U					166	U			151	U
E1668	52663-74-8	PCB-172	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	38411-25-5	PCB-174	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	40186-70-7	PCB-175	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-65-7	PCB-176	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-70-4	PCB-177	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-67-9	PCB-178	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-64-6	PCB-179	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB180+193	PCB-180/193	pg/L	N	28.9	J					166	U			151	U
E1668	74472-47-2	PCB-181	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	60145-23-5	PCB-182	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-68-0	PCB-183	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-48-3	PCB-184	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-49-4	PCB-186	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74487-85-7	PCB-188	pg/L	N	189	U					208	U			189	U
E1668	39635-31-9	PCB-189	pg/L	N	75.5	U					83.1	U			75.5	U

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3140-13		OL-3141-13		OL-3023-EB1		OL-3023-EB1		OL-3023-EB2		OL-3023-EB2	
				Depth (ft)	2.31 - 2.31		1.65 - 1.65									
				Date Sampled	09/14/2018		09/20/2018		09/13/2018		09/13/2018		09/13/2018		09/13/2018	
				SDG	ONO67		8I00663		8I00450		ONO68		8I00450		ONO68	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		EB		EB		EB		EB	
				Type	W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-73-4	PCB-19	pg/L	N	36.60	J					41.50	U			37.70	U
E1668	41411-64-7	PCB-190	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-50-7	PCB-191	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74472-51-8	PCB-192	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	35694-08-7	PCB-194	pg/L	N	113	U					125	U			113	U
E1668	52663-78-2	PCB-195	pg/L	N	113	U					125	U			113	U
E1668	42740-50-1	PCB-196/203	pg/L	N	113	U					125	U			113	U
E1668	PCB198+199	PCB-198/199	pg/L	N	226	U					249	U			226	U
E1668	2051-61-8	PCB-2	pg/L	N	189	U					208	U			189	U
E1668	40186-71-8	PCB-201	pg/L	N	377	U					415	U			377	U
E1668	2136-99-4	PCB-202	pg/L	N	113	U					125	U			113	U
E1668	74472-52-9	PCB-204	pg/L	N	113	U					125	U			113	U
E1668	74472-53-0	PCB-205	pg/L	N	113	U					125	U			113	U
E1668	40186-72-9	PCB-206	pg/L	N	113	U					125	U			113	U
E1668	52663-79-3	PCB-207	pg/L	N	113	U					125	U			113	U
E1668	52663-77-1	PCB-208	pg/L	N	113	U					125	U			113	U
E1668	PCB21+33	PCB-21/33	pg/L	N	12.9	J					83.1	U			75.5	U
E1668	38444-85-8	PCB-22	pg/L	N	34.60	J					41.50	U			37.70	U
E1668	55720-44-0	PCB-23	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	55702-45-9	PCB-24	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	55712-37-3	PCB-25	pg/L	N	74.00						41.50	U			37.70	U
E1668	38444-76-7	PCB-27	pg/L	N	39.00						41.50	U			37.70	U
E1668	PCB28+20	PCB-28/20	pg/L	N	171.0						18.4	J			75.5	U
E1668	PCB29+26	PCB-29/26	pg/L	N	116.0						83.1	U			75.5	U
E1668	2051-62-9	PCB-3	pg/L	N	189	U					208	U			189	U
E1668	16606-02-3	PCB-31	pg/L	N	192.0						19.1	J			13.8	J
E1668	38444-77-8	PCB-32	pg/L	N	61.4						41.5	U			37.7	U
E1668	37680-68-5	PCB-34	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	37680-69-6	PCB-35	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	38444-87-0	PCB-36	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	38444-90-5	PCB-37	pg/L	N	18.5	J					41.5	U			37.7	U
E1668	53555-66-1	PCB-38	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	38444-88-1	PCB-39	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	13029-08-8	PCB-4	pg/L	N	37.7	U					11.5	J			37.7	U
E1668	52663-59-9	PCB-41	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	36559-22-5	PCB-42	pg/L	N	72.5	J					83.1	U			75.5	U
E1668	70362-46-8	PCB-43	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N	227.0						249.0	U			226.0	U
E1668	70362-45-7	PCB-45	pg/L	N	21.2	J					83.1	U			75.5	U
E1668	41464-47-5	PCB-46	pg/L	N	16.6	J					83.1	U			75.5	U
E1668	70362-47-9	PCB-48	pg/L	N	14.6	J					83.1	U			75.5	U
E1668	16605-91-7	PCB-5	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	PCB50+53	PCB-50/53	pg/L	N	283	U					312	U			283	U
E1668	68194-04-7	PCB-51	pg/L	N	75.5	U					83.1	U			75.5	U

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3140-13		OL-3141-13		OL-3023-EB1		OL-3023-EB1		OL-3023-EB2		OL-3023-EB2	
				Depth (ft)	2.31 - 2.31		1.65 - 1.65									
				Date Sampled	09/14/2018		09/20/2018		09/13/2018		09/13/2018		09/13/2018		09/13/2018	
				SDG	ONO67		8I00663		8I00450		ONO68		8I00450		ONO68	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		EB		EB		EB		EB	
				Type	W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	15968-05-5	PCB-54	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	74338-24-2	PCB-55	pg/L	N	35.9	J					13.8	J			75.5	U
E1668	41464-43-1	PCB-56	pg/L	N	14.2	J					83.1	U			75.5	U
E1668	70424-67-8	PCB-57	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	41464-49-7	PCB-58	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N	226	U					249	U			226	U
E1668	25569-80-6	PCB-6	pg/L	N	28.2	J					41.5	U			37.7	U
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N	119	J					332	U			302	U
E1668	74472-34-7	PCB-63	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	32598-10-0	PCB-66	pg/L	N	86.2						83.1	U			75.5	U
E1668	73575-53-8	PCB-67	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	73575-52-7	PCB-68	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB69+49	PCB-69/49	pg/L	N	191.0						166.0	U			151.0	U
E1668	33284-50-3	PCB-7	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	74338-23-1	PCB-73	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	32598-13-3	PCB-77	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	70362-49-1	PCB-78	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	41464-48-6	PCB-79	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	34883-43-7	PCB-8	pg/L	N	34.8	J					41.5	U			37.7	U
E1668	33284-52-5	PCB-80	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	70362-50-4	PCB-81	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-62-4	PCB-82	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	60145-20-2	PCB-83	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	52663-60-2	PCB-84	pg/L	N	28.2	J					83.1	U			75.5	U
E1668	55215-17-3	PCB-88	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	73575-57-2	PCB-89	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	34883-39-1	PCB-9	pg/L	N	37.7	U					41.5	U			37.7	U
E1668	52663-61-3	PCB-92	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	73575-55-0	PCB-94	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	38379-99-6	PCB-95	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	73575-54-9	PCB-96	pg/L	N	75.5	U					83.1	U			75.5	U
E1668	PCB110+115	PCB110+115	pg/L	N	151	U					166	U			151	U
E1668	PCB18+30	PCB18+30	pg/L	N	127.0						13.8	J			11.4	J
E1668	PCB183+185	PCB183+185	pg/L	N	151	U					166	U			151	U
E1668	PCB197+200	PCB197+200	pg/L	N	226	U					249	U			226	U
E1668	PCB40+71	PCB40+71	pg/L	N	151	U					166	U			151	U
E1668	PCB85116117	PCB85+116+117	pg/L	N	109	J					249	U			226	U
E1668	PCB93+100	PCB93+100	pg/L	N	151	U					166	U			151	U
E1668	PCB98+102	PCB98+102	pg/L	N	189	U					208	U			189	U
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	N	5	U					5	U			5	U
SW8260	108-70-3	1,3,5-TRICHLOROBENZENE	ug/l	N	5	U					5	U			5	U
SW8260	71-43-2	BENZENE	ug/l	N	1	U					1	U			1	U
SW8260	108-90-7	CHLOROBENZENE	ug/l	N	1	U					1	U			1	U
SW8260	100-41-4	ETHYLBENZENE	ug/l	N	1	U					1	U			1	U

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3140-13		OL-3141-13		OL-3023-EB1		OL-3023-EB1		OL-3023-EB2		OL-3023-EB2	
				Depth (ft)	2.31 - 2.31		1.65 - 1.65									
				Date Sampled	09/14/2018		09/20/2018		09/13/2018		09/13/2018		09/13/2018		09/13/2018	
				SDG	ONO67		8I00663		8I00450		ONO68		8I00450		ONO68	
				Matrix	WATER		WATER		WATER		WATER		WATER		WATER	
				Purpose	REG		REG		EB		EB		EB		EB	
				Type	W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
SW8260	95-47-6	O-XYLENE	ug/l	N	1	U					1	U			1	U
SW8260	108-88-3	TOLUENE	ug/l	N	1	U					1	U			1	U
SW8260	1330-20-7	XYLENES, TOTAL	ug/l	N	5	U					5	U			5	U
SW8270	120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	N	2	U					2	U			2	U
SW8270	95-50-1	1,2-DICHLOROBENZENE	ug/l	N	2	U					2	U			2	U
SW8270	541-73-1	1,3-DICHLOROBENZENE	ug/l	N	2	U					2	U			2	U
SW8270	106-46-7	1,4-DICHLOROBENZENE	ug/l	N	2	U					2	U			2	U
SW8270	83-32-9	ACENAPHTHENE	ug/l	N	0.5	U					0.6	U			0.5	U
SW8270	120-12-7	ANTHRACENE	ug/l	N	0.5	U					0.6	U			0.5	U
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/l	N	0.5	U					0.6	U			0.5	U
SW8270	50-32-8	BENZO(A)PYRENE	ug/l	N	0.5	U					0.6	U			0.5	U
SW8270	86-73-7	FLUORENE	ug/l	N	0.5	U					0.6	U			0.5	U
SW8270	91-20-3	NAPHTHALENE	ug/l	N	0.5	U					0.6	U			0.5	U
SW8270	85-01-8	PHENANTHRENE	ug/l	N	0.5	U					0.6	U			0.5	U
SW8270	108-95-2	PHENOL	ug/l	N	2	U					2	U			2	U
SW8270	129-00-0	PYRENE	ug/l	N	0.5	U					0.6	U			0.5	U

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	FIELD QC		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3023-FB		OL-3023-FB		OL-3140-FB1		OL-3140-TB1		OL-3141-FB1	
				Depth (ft)										
				Date Sampled	09/13/2018		09/13/2018		09/14/2018		09/14/2018		09/20/2018	
				SDG	8I00450		ONO68		ONO67		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER	
				Purpose	FB		FB		FB		TB		FB	
				Type	BLKWATER		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered										
E1630	22967-92-6	METHYL MERCURY	ug/l	N	0.000038	J							0.000027	J
E1631	7439-97-6	MERCURY	ug/l	N	0.00018	J							0.00038	J
E1631	7439-97-6	MERCURY	ug/l	Y									0.00032	J
E1668	33146-45-1	10-DiCB	pg/L	N			39.6	U	40.0	U				
E1668	74472-36-9	112-PeCB	pg/L	N			79.2	U	80.0	U				
E1668	41411-61-4	142-HxCB	pg/L	N			79.2	U	80.0	U				
E1668	68194-15-0	143-HxCB	pg/L	N			79.2	U	80.0	U				
E1668	41411-62-5	160-HxCB	pg/L	N			79.2	U	80.0	U				
E1668	74472-43-8	161-HxCB	pg/L	N			79.2	U	80.0	U				
E1668	39635-34-2	162-HxCB	pg/L	N			79.2	U	80.0	U				
E1668	74472-45-0	164-HxCB	pg/L	N			79.2	U	80.0	U				
E1668	74472-46-1	165-HxCB	pg/L	N			79.2	U	80.0	U				
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N			79.2	U	80.0	U				
E1668	52663-76-0	203-OcCB	pg/L	N			119	U	120	U				
E1668	52663-58-8	64-TeCB	pg/L	N			79.2	U	80.0	U				
E1668	41464-42-0	72-TeCB	pg/L	N			79.2	U	80.0	U				
E1668	31508-00-6	PCB 118	pg/L	N			79.2	U	80.0	U				
E1668	2051-24-3	PCB 209	pg/L	N			990	U	1000	U				
E1668	35693-99-3	PCB 52	pg/L	N			79.2	U	80.0	U				
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N			79.2	U	80.0	U				
E1668	2051-60-7	PCB-1	pg/L	N			198	U	200	U				
E1668	60145-21-3	PCB-103	pg/L	N			79.2	U	80.0	U				
E1668	56558-16-8	PCB-104	pg/L	N			79.2	U	80.0	U				
E1668	32598-14-4	PCB-105	pg/L	N			79.2	U	80.0	U				
E1668	70424-69-0	PCB-106/118	pg/L	N			79.2	U	80.0	U				
E1668	70424-68-9	PCB-107	pg/L	N			79.2	U	80.0	U				
E1668	PCB108+124	PCB-108/124	pg/L	N			158	U	160	U				
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N			475	U	480	U				
E1668	2050-67-1	PCB-11	pg/L	N			297	U	300	U				
E1668	39635-32-0	PCB-111	pg/L	N			79.2	U	80.0	UJ				
E1668	PCB11390101	PCB-113/90/101	pg/L	N			238	U	240	U				
E1668	74472-37-0	PCB-114	pg/L	N			79.2	U	80.0	U				
E1668	PCB12+13	PCB-12/13	pg/L	N			79.2	U	80.0	U				
E1668	68194-12-7	PCB-120	pg/L	N			79.2	U	80.0	U				
E1668	56558-18-0	PCB-121	pg/L	N			79.2	U	80.0	U				
E1668	76842-07-4	PCB-122	pg/L	N			79.2	U	80.0	U				
E1668	65510-44-3	PCB-123	pg/L	N			79.2	U	80.0	U				
E1668	57465-28-8	PCB-126	pg/L	N			79.2	U	80.0	U				
E1668	39635-33-1	PCB-127	pg/L	N			79.2	U	80.0	U				
E1668	PCB128+166	PCB-128/166	pg/L	N			158	U	160	U				
E1668	52663-66-8	PCB-130	pg/L	N			79.2	U	80.0	U				
E1668	61798-70-7	PCB-131	pg/L	N			79.2	U	80.0	U				
E1668	38380-05-1	PCB-132	pg/L	N			79.2	U	80.0	U				
E1668	35694-04-3	PCB-133	pg/L	N			79.2	U	80.0	U				

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	FIELD QC		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3023-FB		OL-3023-FB		OL-3140-FB1		OL-3140-TB1		OL-3141-FB1	
				Depth (ft)										
				Date Sampled	09/13/2018		09/13/2018		09/14/2018		09/14/2018		09/20/2018	
				SDG	8I00450		ONO68		ONO67		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER	
				Purpose	FB		FB		FB		TB		FB	
				Type	BLKWATER		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered										
E1668	52704-70-8	PCB-134	pg/L	N			79.2	U	80.0	U				
E1668	38411-22-2	PCB-136	pg/L	N			79.2	U	80.0	U				
E1668	35694-06-5	PCB-137	pg/L	N			79.2	U	80.0	U				
E1668	PCB138163129	PCB-138/163/129	pg/L	N			238	U	240	U				
E1668	PCB139+140	PCB-139/140	pg/L	N			158	U	160	U				
E1668	34883-41-5	PCB-14	pg/L	N			39.6	U	40.0	U				
E1668	52712-04-6	PCB-141	pg/L	N			79.2	U	80.0	U				
E1668	68194-14-9	PCB-144	pg/L	N			79.2	U	80.0	U				
E1668	74472-40-5	PCB-145	pg/L	N			79.2	U	80.0	U				
E1668	51908-16-8	PCB-146	pg/L	N			79.2	U	80.0	U				
E1668	PCB147+149	PCB-147/149	pg/L	N			158	U	160	U				
E1668	74472-41-6	PCB-148	pg/L	N			79.2	U	80.0	U				
E1668	2050-68-2	PCB-15	pg/L	N			39.6	U	40.0	U				
E1668	68194-08-1	PCB-150	pg/L	N			79.2	U	80.0	U				
E1668	PCB151+135	PCB-151/135	pg/L	N			158	U	160	U				
E1668	68194-09-2	PCB-152	pg/L	N			79.2	U	80.0	U				
E1668	38380-01-7	PCB-153	pg/L	N			79.2	U	80.0	U				
E1668	PCB153+168	PCB-153/168	pg/L	N			158	U	160	U				
E1668	60145-22-4	PCB-154	pg/L	N			198	U	200	U				
E1668	33979-03-2	PCB-155	pg/L	N			79.2	U	80.0	U				
E1668	PCB156+157	PCB-156/157	pg/L	N			158	U	160	U				
E1668	74472-42-7	PCB-158	pg/L	N			79.2	U	80.0	U				
E1668	39635-35-3	PCB-159	pg/L	N			79.2	U	80.0	U				
E1668	38444-78-9	PCB-16	pg/L	N			39.6	U	40.0	U				
E1668	52663-72-6	PCB-167	pg/L	N			79.2	U	80.0	U				
E1668	32774-16-6	PCB-169	pg/L	N			79.2	U	80.0	U				
E1668	37680-66-3	PCB-17	pg/L	N			39.6	U	40.0	U				
E1668	35065-30-6	PCB-170	pg/L	N			79.2	U	80.0	U				
E1668	PCB171+173	PCB-171/173	pg/L	N			158	U	160	U				
E1668	52663-74-8	PCB-172	pg/L	N			79.2	U	80.0	U				
E1668	38411-25-5	PCB-174	pg/L	N			79.2	U	80.0	U				
E1668	40186-70-7	PCB-175	pg/L	N			79.2	U	80.0	U				
E1668	52663-65-7	PCB-176	pg/L	N			79.2	U	80.0	U				
E1668	52663-70-4	PCB-177	pg/L	N			79.2	U	80.0	U				
E1668	52663-67-9	PCB-178	pg/L	N			79.2	U	80.0	UJ				
E1668	52663-64-6	PCB-179	pg/L	N			79.2	U	80.0	U				
E1668	PCB180+193	PCB-180/193	pg/L	N			158	U	160	U				
E1668	74472-47-2	PCB-181	pg/L	N			79.2	U	80.0	U				
E1668	60145-23-5	PCB-182	pg/L	N			79.2	U	80.0	U				
E1668	52663-68-0	PCB-183	pg/L	N			79.2	U	80.0	U				
E1668	74472-48-3	PCB-184	pg/L	N			79.2	U	80.0	U				
E1668	74472-49-4	PCB-186	pg/L	N			79.2	U	80.0	U				
E1668	74487-85-7	PCB-188	pg/L	N			198	U	200	U				
E1668	39635-31-9	PCB-189	pg/L	N			79.2	U	80.0	U				

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	FIELD QC		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3023-FB		OL-3023-FB		OL-3140-FB1		OL-3140-TB1		OL-3141-FB1	
				Depth (ft)										
				Date Sampled	09/13/2018		09/13/2018		09/14/2018		09/14/2018		09/20/2018	
				SDG	8I00450		ONO68		ONO67		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER	
				Purpose	FB		FB		FB		TB		FB	
				Type	BLKWATER		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered										
E1668	38444-73-4	PCB-19	pg/L	N			39.60	U	40.00	U				
E1668	41411-64-7	PCB-190	pg/L	N			79.2	U	80.0	U				
E1668	74472-50-7	PCB-191	pg/L	N			79.2	U	80.0	U				
E1668	74472-51-8	PCB-192	pg/L	N			79.2	U	80.0	U				
E1668	35694-08-7	PCB-194	pg/L	N			119	U	120	U				
E1668	52663-78-2	PCB-195	pg/L	N			119	U	120	U				
E1668	42740-50-1	PCB-196/203	pg/L	N			119	U	120	U				
E1668	PCB198+199	PCB-198/199	pg/L	N			238	U	240	U				
E1668	2051-61-8	PCB-2	pg/L	N			198	U	200	U				
E1668	40186-71-8	PCB-201	pg/L	N			396	U	400	U				
E1668	2136-99-4	PCB-202	pg/L	N			119	U	120	U				
E1668	74472-52-9	PCB-204	pg/L	N			119	U	120	U				
E1668	74472-53-0	PCB-205	pg/L	N			119	U	120	U				
E1668	40186-72-9	PCB-206	pg/L	N			119	U	120	U				
E1668	52663-79-3	PCB-207	pg/L	N			119	U	120	U				
E1668	52663-77-1	PCB-208	pg/L	N			119	U	120	U				
E1668	PCB21+33	PCB-21/33	pg/L	N			79.2	U	80.0	U				
E1668	38444-85-8	PCB-22	pg/L	N			39.60	U	40.00	U				
E1668	55720-44-0	PCB-23	pg/L	N			39.6	U	40.0	U				
E1668	55702-45-9	PCB-24	pg/L	N			39.6	U	40.0	U				
E1668	55712-37-3	PCB-25	pg/L	N			39.60	U	40.00	U				
E1668	38444-76-7	PCB-27	pg/L	N			39.60	U	40.00	U				
E1668	PCB28+20	PCB-28/20	pg/L	N			79.2	U	80.0	U				
E1668	PCB29+26	PCB-29/26	pg/L	N			79.2	U	80.0	U				
E1668	2051-62-9	PCB-3	pg/L	N			198	U	200	U				
E1668	16606-02-3	PCB-31	pg/L	N			39.6	U	40.0	U				
E1668	38444-77-8	PCB-32	pg/L	N			39.6	U	40.0	U				
E1668	37680-68-5	PCB-34	pg/L	N			39.6	U	40.0	U				
E1668	37680-69-6	PCB-35	pg/L	N			39.6	U	40.0	U				
E1668	38444-87-0	PCB-36	pg/L	N			39.6	U	40.0	U				
E1668	38444-90-5	PCB-37	pg/L	N			39.6	U	40.0	U				
E1668	53555-66-1	PCB-38	pg/L	N			39.6	U	40.0	U				
E1668	38444-88-1	PCB-39	pg/L	N			39.6	U	40.0	U				
E1668	13029-08-8	PCB-4	pg/L	N			39.6	U	40.0	U				
E1668	52663-59-9	PCB-41	pg/L	N			79.2	U	80.0	U				
E1668	36559-22-5	PCB-42	pg/L	N			79.2	U	80.0	U				
E1668	70362-46-8	PCB-43	pg/L	N			79.2	U	80.0	U				
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N			238.0	U	240.0	U				
E1668	70362-45-7	PCB-45	pg/L	N			79.2	U	80.0	U				
E1668	41464-47-5	PCB-46	pg/L	N			79.2	U	80.0	U				
E1668	70362-47-9	PCB-48	pg/L	N			79.2	U	80.0	U				
E1668	16605-91-7	PCB-5	pg/L	N			39.6	U	40.0	U				
E1668	PCB50+53	PCB-50/53	pg/L	N			297	U	300	U				
E1668	68194-04-7	PCB-51	pg/L	N			79.2	U	80.0	U				

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	FIELD QC		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3023-FB		OL-3023-FB		OL-3140-FB1		OL-3140-TB1		OL-3141-FB1	
				Depth (ft)										
				Date Sampled	09/13/2018		09/13/2018		09/14/2018		09/14/2018		09/20/2018	
				SDG	8I00450		ONO68		ONO67		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER	
				Purpose	FB		FB		FB		TB		FB	
				Type	BLKWATER		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered										
E1668	15968-05-5	PCB-54	pg/L	N			79.2	U	80.0	U				
E1668	74338-24-2	PCB-55	pg/L	N			79.2	U	80.0	U				
E1668	41464-43-1	PCB-56	pg/L	N			79.2	U	80.0	U				
E1668	70424-67-8	PCB-57	pg/L	N			79.2	U	80.0	U				
E1668	41464-49-7	PCB-58	pg/L	N			79.2	U	80.0	U				
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N			238	U	240	U				
E1668	25569-80-6	PCB-6	pg/L	N			39.6	U	40.0	U				
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N			317	U	320	U				
E1668	74472-34-7	PCB-63	pg/L	N			79.2	U	80.0	U				
E1668	32598-10-0	PCB-66	pg/L	N			79.2	U	80.0	U				
E1668	73575-53-8	PCB-67	pg/L	N			79.2	U	80.0	U				
E1668	73575-52-7	PCB-68	pg/L	N			79.2	U	80.0	U				
E1668	PCB69+49	PCB-69/49	pg/L	N			158.0	U	160.0	U				
E1668	33284-50-3	PCB-7	pg/L	N			39.6	U	40.0	U				
E1668	74338-23-1	PCB-73	pg/L	N			79.2	U	80.0	U				
E1668	32598-13-3	PCB-77	pg/L	N			79.2	U	80.0	U				
E1668	70362-49-1	PCB-78	pg/L	N			79.2	U	80.0	U				
E1668	41464-48-6	PCB-79	pg/L	N			79.2	U	80.0	U				
E1668	34883-43-7	PCB-8	pg/L	N			39.6	U	40.0	U				
E1668	33284-52-5	PCB-80	pg/L	N			79.2	U	80.0	U				
E1668	70362-50-4	PCB-81	pg/L	N			79.2	U	80.0	U				
E1668	52663-62-4	PCB-82	pg/L	N			79.2	U	80.0	U				
E1668	60145-20-2	PCB-83	pg/L	N			79.2	U	80.0	U				
E1668	52663-60-2	PCB-84	pg/L	N			79.2	U	80.0	U				
E1668	55215-17-3	PCB-88	pg/L	N			79.2	U	80.0	U				
E1668	73575-57-2	PCB-89	pg/L	N			79.2	U	80.0	U				
E1668	34883-39-1	PCB-9	pg/L	N			39.6	U	40.0	U				
E1668	52663-61-3	PCB-92	pg/L	N			79.2	U	80.0	U				
E1668	73575-55-0	PCB-94	pg/L	N			79.2	U	80.0	U				
E1668	38379-99-6	PCB-95	pg/L	N			79.2	U	80.0	U				
E1668	73575-54-9	PCB-96	pg/L	N			79.2	U	80.0	U				
E1668	PCB110+115	PCB110+115	pg/L	N			158	U	160	U				
E1668	PCB18+30	PCB18+30	pg/L	N			79.2	U	80.0	U				
E1668	PCB183+185	PCB183+185	pg/L	N			158	U	160	U				
E1668	PCB197+200	PCB197+200	pg/L	N			238	U	240	U				
E1668	PCB40+71	PCB40+71	pg/L	N			158	U	160	U				
E1668	PCB85116117	PCB85+116+117	pg/L	N			238	U	240	U				
E1668	PCB93+100	PCB93+100	pg/L	N			158	U	160	U				
E1668	PCB98+102	PCB98+102	pg/L	N			198	U	200	U				
SW8260	87-61-6	1,2,3-TRICHLOROBENZENE	ug/l	N			5	U	5	U	5	U		
SW8260	108-70-3	1,3,5-TRICHLOROBENZENE	ug/l	N			5	U	5	U	5	U		
SW8260	71-43-2	BENZENE	ug/l	N			1	U	1	U	1	U		
SW8260	108-90-7	CHLOROBENZENE	ug/l	N			1	U	1	U	1	U		
SW8260	100-41-4	ETHYLBENZENE	ug/l	N			1	U	1	U	1	U		

Onondaga Lake (Syracuse NY)
Surface Water

				Location ID	FIELD QC		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
				Field Sample ID	OL-3023-FB		OL-3023-FB		OL-3140-FB1		OL-3140-TB1		OL-3141-FB1	
				Depth (ft)										
				Date Sampled	09/13/2018		09/13/2018		09/14/2018		09/14/2018		09/20/2018	
				SDG	8I00450		ONO68		ONO67		ONO67		8I00663	
				Matrix	WATER		WATER		WATER		WATER		WATER	
				Purpose	FB		FB		FB		TB		FB	
				Type	BLKWATER		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered										
SW8260	95-47-6	O-XYLENE	ug/l	N			1	U	1	U	1	U		
SW8260	108-88-3	TOLUENE	ug/l	N			0.7	J	1	U	1	U		
SW8260	1330-20-7	XYLENES, TOTAL	ug/l	N			5	U	5	U	5	U		
SW8270	120-82-1	1,2,4-TRICHLOROBENZENE	ug/l	N			2	U	2	U				
SW8270	95-50-1	1,2-DICHLOROBENZENE	ug/l	N			2	U	2	U				
SW8270	541-73-1	1,3-DICHLOROBENZENE	ug/l	N			2	U	2	U				
SW8270	106-46-7	1,4-DICHLOROBENZENE	ug/l	N			2	U	2	U				
SW8270	83-32-9	ACENAPHTHENE	ug/l	N			0.6	U	0.5	U				
SW8270	120-12-7	ANTHRACENE	ug/l	N			0.6	U	0.5	U				
SW8270	56-55-3	BENZO(A)ANTHRACENE	ug/l	N			0.6	U	0.5	U				
SW8270	50-32-8	BENZO(A)PYRENE	ug/l	N			0.6	U	0.5	U				
SW8270	86-73-7	FLUORENE	ug/l	N			0.6	U	0.5	U				
SW8270	91-20-3	NAPHTHALENE	ug/l	N			0.6	U	0.5	U				
SW8270	85-01-8	PHENANTHRENE	ug/l	N			0.6	U	0.5	U				
SW8270	108-95-2	PHENOL	ug/l	N			2	U	2	U				
SW8270	129-00-0	PYRENE	ug/l	N			0.6	U	0.5	U				

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
Field Sample ID					OL-3142-01		OL-3142-02		OL-3142-01		OL-3142-02		OL-3142-03		OL-3142-03	
Depth (ft)					6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		8K00376		ONO72		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		FD		REG		FD		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N	0.000026	U	0.000026	U					0.000026	U		
E1631	7439-97-6	MERCURY	ug/l	N	0.00127		0.00105						0.00124			
E1631	7439-97-6	MERCURY	ug/l	Y	0.00034	J	0.00027	J					0.0003	J		
E1668	33146-45-1	10-DiCB	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	74472-36-9	112-PeCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	41411-61-4	142-HxCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	68194-15-0	143-HxCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	41411-62-5	160-HxCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-43-8	161-HxCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	39635-34-2	162-HxCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-45-0	164-HxCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-46-1	165-HxCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-76-0	203-OcCB	pg/L	N					113	U	112	U			113	U
E1668	52663-58-8	64-TeCB	pg/L	N					30.2	J	30.9	J			32.5	J
E1668	41464-42-0	72-TeCB	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	31508-00-6	PCB 118	pg/L	N					20.6	J	22.6	J			25.3	J
E1668	2051-24-3	PCB 209	pg/L	N					943	U	935	U			943	U
E1668	35693-99-3	PCB 52	pg/L	N					83.0		78.6				92.2	
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	2051-60-7	PCB-1	pg/L	N					189	U	187	U			189	U
E1668	60145-21-3	PCB-103	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	56558-16-8	PCB-104	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	32598-14-4	PCB-105	pg/L	N					75.5	U	14.6	J			75.5	U
E1668	70424-69-0	PCB-106/118	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	70424-68-9	PCB-107	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB108+124	PCB-108/124	pg/L	N					151	U	150	U			151	U
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N					453	U	449	U			453	U
E1668	2050-67-1	PCB-11	pg/L	N					283	U	280	U			283	U
E1668	39635-32-0	PCB-111	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB11390101	PCB-113/90/101	pg/L	N					226	U	224	U			226	U
E1668	74472-37-0	PCB-114	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB12+13	PCB-12/13	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	68194-12-7	PCB-120	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	56558-18-0	PCB-121	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	76842-07-4	PCB-122	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	65510-44-3	PCB-123	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	57465-28-8	PCB-126	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	39635-33-1	PCB-127	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB128+166	PCB-128/166	pg/L	N					151	U	150	U			151	U

Location ID					DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
Field Sample ID					OL-3142-01		OL-3142-02		OL-3142-01		OL-3142-02		OL-3142-03		OL-3142-03	
Depth (ft)					6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		8K00376		ONO72		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		FD		REG		FD		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52663-66-8	PCB-130	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	61798-70-7	PCB-131	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	38380-05-1	PCB-132	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	35694-04-3	PCB-133	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52704-70-8	PCB-134	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	38411-22-2	PCB-136	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	35694-06-5	PCB-137	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB138163129	PCB-138/163/129	pg/L	N					226	U	224	U			226	U
E1668	PCB139+140	PCB-139/140	pg/L	N					151	U	150	U			151	U
E1668	34883-41-5	PCB-14	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	52712-04-6	PCB-141	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	68194-14-9	PCB-144	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-40-5	PCB-145	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	51908-16-8	PCB-146	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB147+149	PCB-147/149	pg/L	N					151	U	150	U			151	U
E1668	74472-41-6	PCB-148	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	2050-68-2	PCB-15	pg/L	N					16.8	J	17.2	J			28.2	J
E1668	68194-08-1	PCB-150	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB151+135	PCB-151/135	pg/L	N					151	U	150	U			151	U
E1668	68194-09-2	PCB-152	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	38380-01-7	PCB-153	pg/L	N					75.5	U	18.6	J			20.3	J
E1668	PCB153+168	PCB-153/168	pg/L	N					151	U	150	U			30.4	J
E1668	60145-22-4	PCB-154	pg/L	N					189	U	187	U			189	U
E1668	33979-03-2	PCB-155	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB156+157	PCB-156/157	pg/L	N					151	U	150	U			151	U
E1668	74472-42-7	PCB-158	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	39635-35-3	PCB-159	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	38444-78-9	PCB-16	pg/L	N					41.3	J	37.4	UJ			18.0	J
E1668	52663-72-6	PCB-167	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	32774-16-6	PCB-169	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	37680-66-3	PCB-17	pg/L	N					51.0		49.7				35.2	J
E1668	35065-30-6	PCB-170	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB171+173	PCB-171/173	pg/L	N					151	U	150	U			151	U
E1668	52663-74-8	PCB-172	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	38411-25-5	PCB-174	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	40186-70-7	PCB-175	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-65-7	PCB-176	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-70-4	PCB-177	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-67-9	PCB-178	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-64-6	PCB-179	pg/L	N					75.5	U	74.8	U			75.5	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
Field Sample ID					OL-3142-01		OL-3142-02		OL-3142-01		OL-3142-02		OL-3142-03		OL-3142-03	
Depth (ft)					6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		8K00376		ONO72		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		FD		REG		FD		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	PCB180+193	PCB-180/193	pg/L	N					151	U	150	U			151	U
E1668	74472-47-2	PCB-181	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	60145-23-5	PCB-182	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-68-0	PCB-183	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-48-3	PCB-184	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-49-4	PCB-186	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74487-85-7	PCB-188	pg/L	N					189	U	187	U			189	U
E1668	39635-31-9	PCB-189	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	38444-73-4	PCB-19	pg/L	N					22.7	J	19.3	J			21.8	J
E1668	41411-64-7	PCB-190	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-50-7	PCB-191	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74472-51-8	PCB-192	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	35694-08-7	PCB-194	pg/L	N					113	U	112	U			113	U
E1668	52663-78-2	PCB-195	pg/L	N					113	U	112	U			113	U
E1668	42740-50-1	PCB-196/203	pg/L	N					113	U	112	U			113	U
E1668	PCB198+199	PCB-198/199	pg/L	N					226	U	224	U			226	U
E1668	2051-61-8	PCB-2	pg/L	N					189	U	187	U			189	U
E1668	40186-71-8	PCB-201	pg/L	N					377	U	374	U			377	U
E1668	2136-99-4	PCB-202	pg/L	N					113	U	112	U			113	U
E1668	74472-52-9	PCB-204	pg/L	N					113	U	112	U			113	U
E1668	74472-53-0	PCB-205	pg/L	N					113	U	112	U			113	U
E1668	40186-72-9	PCB-206	pg/L	N					113	U	112	U			113	U
E1668	52663-79-3	PCB-207	pg/L	N					113	U	112	U			113	U
E1668	52663-77-1	PCB-208	pg/L	N					113	U	112	U			113	U
E1668	PCB21+33	PCB-21/33	pg/L	N					33.5	J	39.7	J			75.5	U
E1668	38444-85-8	PCB-22	pg/L	N					24.6	J	24.0	J			19.2	J
E1668	55720-44-0	PCB-23	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	55702-45-9	PCB-24	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	55712-37-3	PCB-25	pg/L	N					37.7	U	18.9	J			28.3	J
E1668	38444-76-7	PCB-27	pg/L	N					12.8	J	14.4	J			12.9	J
E1668	PCB28+20	PCB-28/20	pg/L	N					67.8	J	74.3	J			75.7	
E1668	PCB29+26	PCB-29/26	pg/L	N					29.6	J	30.5	J			44.1	J
E1668	2051-62-9	PCB-3	pg/L	N					189	U	187	U			189	U
E1668	16606-02-3	PCB-31	pg/L	N					74.5		81.4				75.2	
E1668	38444-77-8	PCB-32	pg/L	N					32.7	J	34.1	J			31.4	J
E1668	37680-68-5	PCB-34	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	37680-69-6	PCB-35	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	38444-87-0	PCB-36	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	38444-90-5	PCB-37	pg/L	N					14.6	J	15.5	J			12.9	J
E1668	53555-66-1	PCB-38	pg/L	N					37.7	U	37.4	U			37.7	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
Field Sample ID					OL-3142-01		OL-3142-02		OL-3142-01		OL-3142-02		OL-3142-03		OL-3142-03	
Depth (ft)					6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		8K00376		ONO72		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		FD		REG		FD		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-88-1	PCB-39	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	13029-08-8	PCB-4	pg/L	N					39.7		37.0	J			37.7	U
E1668	52663-59-9	PCB-41	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	36559-22-5	PCB-42	pg/L	N					24.4	J	28.9	J			31.2	J
E1668	70362-46-8	PCB-43	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N					76.5	J	80.6	J			87.3	J
E1668	70362-45-7	PCB-45	pg/L	N					13.3	J	13.4	J			75.5	U
E1668	41464-47-5	PCB-46	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	70362-47-9	PCB-48	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	16605-91-7	PCB-5	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	PCB50+53	PCB-50/53	pg/L	N					283	U	280	U			283	U
E1668	68194-04-7	PCB-51	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	15968-05-5	PCB-54	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	74338-24-2	PCB-55	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	41464-43-1	PCB-56	pg/L	N					18.6	J	20.7	J			18.9	J
E1668	70424-67-8	PCB-57	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	41464-49-7	PCB-58	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N					226	U	224	U			226	U
E1668	25569-80-6	PCB-6	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N					55.6	J	59.9	J			61.5	J
E1668	74472-34-7	PCB-63	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	32598-10-0	PCB-66	pg/L	N					33.4	J	36.3	J			40.2	J
E1668	73575-53-8	PCB-67	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	73575-52-7	PCB-68	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB69+49	PCB-69/49	pg/L	N					52.9	J	55.6	J			65.1	J
E1668	33284-50-3	PCB-7	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	74338-23-1	PCB-73	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	32598-13-3	PCB-77	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	70362-49-1	PCB-78	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	41464-48-6	PCB-79	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	34883-43-7	PCB-8	pg/L	N					34.6	J	36.3	J			17.7	J
E1668	33284-52-5	PCB-80	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	70362-50-4	PCB-81	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-62-4	PCB-82	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	60145-20-2	PCB-83	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	52663-60-2	PCB-84	pg/L	N					13.7	J	13.6	J			14.1	J
E1668	55215-17-3	PCB-88	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	73575-57-2	PCB-89	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	34883-39-1	PCB-9	pg/L	N					37.7	U	37.4	U			37.7	U
E1668	52663-61-3	PCB-92	pg/L	N					75.5	U	74.8	U			75.5	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					DEEP_N		DEEP_N		DEEP_N		DEEP_N		DEEP_S		DEEP_S	
Field Sample ID					OL-3142-01		OL-3142-02		OL-3142-01		OL-3142-02		OL-3142-03		OL-3142-03	
Depth (ft)					6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6		6.6 - 6.6	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		8K00376		ONO72		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		FD		REG		FD		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	73575-55-0	PCB-94	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	38379-99-6	PCB-95	pg/L	N					32.4	J	33.2	J			35.2	J
E1668	73575-54-9	PCB-96	pg/L	N					75.5	U	74.8	U			75.5	U
E1668	PCB110+115	PCB110+115	pg/L	N					151	U	150	U			151	U
E1668	PCB18+30	PCB18+30	pg/L	N					85.4		85.3				48.3	J
E1668	PCB183+185	PCB183+185	pg/L	N					151	U	150	U			151	U
E1668	PCB197+200	PCB197+200	pg/L	N					226	U	224	U			226	U
E1668	PCB40+71	PCB40+71	pg/L	N					34.3	J	38.4	J			41.3	J
E1668	PCB85116117	PCB85+116+117	pg/L	N					226	U	224	U			226	U
E1668	PCB93+100	PCB93+100	pg/L	N					151	U	150	U			151	U
E1668	PCB98+102	PCB98+102	pg/L	N					189	U	187	U			189	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
Field Sample ID					OL-3142-04		OL-3142-04		OL-3142-05		OL-3142-05		OL-3142-06		OL-3142-06	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.99 - 0.99	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N	0.00007				0.000026	U			0.000026	U		
E1631	7439-97-6	MERCURY	ug/l	N	0.00165				0.00079				0.00072			
E1631	7439-97-6	MERCURY	ug/l	Y	0.0004	J			0.00024	J			0.00022	J		
E1668	33146-45-1	10-DiCB	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	74472-36-9	112-PeCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	41411-61-4	142-HxCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	68194-15-0	143-HxCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	41411-62-5	160-HxCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-43-8	161-HxCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	39635-34-2	162-HxCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-45-0	164-HxCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-46-1	165-HxCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-76-0	203-OcCB	pg/L	N			113	U			114	U			114	U
E1668	52663-58-8	64-TeCB	pg/L	N			19.5	J			24.8	J			21.6	J
E1668	41464-42-0	72-TeCB	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	31508-00-6	PCB 118	pg/L	N			21.1	J			19.9	J			16.4	J
E1668	2051-24-3	PCB 209	pg/L	N			943	U			952	U			952	U
E1668	35693-99-3	PCB 52	pg/L	N			38.3	J			75.0	J			61.6	J
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	2051-60-7	PCB-1	pg/L	N			189	U			190	U			190	U
E1668	60145-21-3	PCB-103	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	56558-16-8	PCB-104	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	32598-14-4	PCB-105	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	70424-69-0	PCB-106/118	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	70424-68-9	PCB-107	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB108+124	PCB-108/124	pg/L	N			151	U			152	U			152	U
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N			453	U			457	U			457	U
E1668	2050-67-1	PCB-11	pg/L	N			283	U			286	U			286	U
E1668	39635-32-0	PCB-111	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB11390101	PCB-113/90/101	pg/L	N			226	U			229	U			229	U
E1668	74472-37-0	PCB-114	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB12+13	PCB-12/13	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	68194-12-7	PCB-120	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	56558-18-0	PCB-121	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	76842-07-4	PCB-122	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	65510-44-3	PCB-123	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	57465-28-8	PCB-126	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	39635-33-1	PCB-127	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB128+166	PCB-128/166	pg/L	N			151	U			152	U			152	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
Field Sample ID					OL-3142-04		OL-3142-04		OL-3142-05		OL-3142-05		OL-3142-06		OL-3142-06	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.99 - 0.99	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52663-66-8	PCB-130	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	61798-70-7	PCB-131	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38380-05-1	PCB-132	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	35694-04-3	PCB-133	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52704-70-8	PCB-134	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38411-22-2	PCB-136	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	35694-06-5	PCB-137	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB138163129	PCB-138/163/129	pg/L	N			226	U			229	U			229	U
E1668	PCB139+140	PCB-139/140	pg/L	N			151	U			152	U			152	U
E1668	34883-41-5	PCB-14	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	52712-04-6	PCB-141	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	68194-14-9	PCB-144	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-40-5	PCB-145	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	51908-16-8	PCB-146	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB147+149	PCB-147/149	pg/L	N			151	U			152	U			152	U
E1668	74472-41-6	PCB-148	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	2050-68-2	PCB-15	pg/L	N			37.7	U			18.6	J			38.1	U
E1668	68194-08-1	PCB-150	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB151+135	PCB-151/135	pg/L	N			151	U			152	U			152	U
E1668	68194-09-2	PCB-152	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38380-01-7	PCB-153	pg/L	N			75.5	U			15.8	J			76.2	U
E1668	PCB153+168	PCB-153/168	pg/L	N			151	U			152	U			152	U
E1668	60145-22-4	PCB-154	pg/L	N			189	U			190	U			190	U
E1668	33979-03-2	PCB-155	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB156+157	PCB-156/157	pg/L	N			151	U			152	U			152	U
E1668	74472-42-7	PCB-158	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	39635-35-3	PCB-159	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38444-78-9	PCB-16	pg/L	N			9.52	J			15.2	J			13.4	J
E1668	52663-72-6	PCB-167	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	32774-16-6	PCB-169	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	37680-66-3	PCB-17	pg/L	N			10.3	J			27.3	J			24.6	J
E1668	35065-30-6	PCB-170	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB171+173	PCB-171/173	pg/L	N			151	U			152	U			152	U
E1668	52663-74-8	PCB-172	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38411-25-5	PCB-174	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	40186-70-7	PCB-175	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-65-7	PCB-176	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-70-4	PCB-177	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-67-9	PCB-178	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-64-6	PCB-179	pg/L	N			75.5	U			76.2	U			76.2	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
Field Sample ID					OL-3142-04		OL-3142-04		OL-3142-05		OL-3142-05		OL-3142-06		OL-3142-06	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.99 - 0.99	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	PCB180+193	PCB-180/193	pg/L	N			151	U			152	U			152	U
E1668	74472-47-2	PCB-181	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	60145-23-5	PCB-182	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-68-0	PCB-183	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-48-3	PCB-184	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-49-4	PCB-186	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74487-85-7	PCB-188	pg/L	N			189	U			190	U			190	U
E1668	39635-31-9	PCB-189	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38444-73-4	PCB-19	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	41411-64-7	PCB-190	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-50-7	PCB-191	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74472-51-8	PCB-192	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	35694-08-7	PCB-194	pg/L	N			113	U			114	U			114	U
E1668	52663-78-2	PCB-195	pg/L	N			113	U			114	U			114	U
E1668	42740-50-1	PCB-196/203	pg/L	N			113	U			114	U			114	U
E1668	PCB198+199	PCB-198/199	pg/L	N			226	U			229	U			229	U
E1668	2051-61-8	PCB-2	pg/L	N			189	U			190	U			190	U
E1668	40186-71-8	PCB-201	pg/L	N			377	U			381	U			381	U
E1668	2136-99-4	PCB-202	pg/L	N			113	U			114	U			114	U
E1668	74472-52-9	PCB-204	pg/L	N			113	U			114	U			114	U
E1668	74472-53-0	PCB-205	pg/L	N			113	U			114	U			114	U
E1668	40186-72-9	PCB-206	pg/L	N			113	U			114	U			114	U
E1668	52663-79-3	PCB-207	pg/L	N			113	U			114	U			114	U
E1668	52663-77-1	PCB-208	pg/L	N			113	U			114	U			114	U
E1668	PCB21+33	PCB-21/33	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38444-85-8	PCB-22	pg/L	N			12.6	J			15.5	J			14.5	J
E1668	55720-44-0	PCB-23	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	55702-45-9	PCB-24	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	55712-37-3	PCB-25	pg/L	N			37.7	U			22.5	J			19.9	J
E1668	38444-76-7	PCB-27	pg/L	N			37.7	U			10.1	J			8.26	J
E1668	PCB28+20	PCB-28/20	pg/L	N			37.2	J			59.8	J			54.5	J
E1668	PCB29+26	PCB-29/26	pg/L	N			75.5	U			35.3	J			29.1	J
E1668	2051-62-9	PCB-3	pg/L	N			189	U			190	U			190	U
E1668	16606-02-3	PCB-31	pg/L	N			32.2	J			59.7				52.5	
E1668	38444-77-8	PCB-32	pg/L	N			7.27	J			25.9	J			22.5	J
E1668	37680-68-5	PCB-34	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	37680-69-6	PCB-35	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	38444-87-0	PCB-36	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	38444-90-5	PCB-37	pg/L	N			37.7	U			10.1	J			10.5	J
E1668	53555-66-1	PCB-38	pg/L	N			37.7	U			38.1	U			38.1	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
Field Sample ID					OL-3142-04		OL-3142-04		OL-3142-05		OL-3142-05		OL-3142-06		OL-3142-06	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.99 - 0.99	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-88-1	PCB-39	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	13029-08-8	PCB-4	pg/L	N			9.20	J			44.1				35.2	J
E1668	52663-59-9	PCB-41	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	36559-22-5	PCB-42	pg/L	N			75.5	U			22.7	J			20.8	J
E1668	70362-46-8	PCB-43	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N			36.9	J			66.6	J			57.7	J
E1668	70362-45-7	PCB-45	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	41464-47-5	PCB-46	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	70362-47-9	PCB-48	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	16605-91-7	PCB-5	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	PCB50+53	PCB-50/53	pg/L	N			283	U			286	U			286	U
E1668	68194-04-7	PCB-51	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	15968-05-5	PCB-54	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	74338-24-2	PCB-55	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	41464-43-1	PCB-56	pg/L	N			14.7	J			16.1	J			76.2	U
E1668	70424-67-8	PCB-57	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	41464-49-7	PCB-58	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N			226	U			229	U			229	U
E1668	25569-80-6	PCB-6	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N			54.4	J			51.6	J			305	U
E1668	74472-34-7	PCB-63	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	32598-10-0	PCB-66	pg/L	N			31.5	J			30.2	J			25.9	J
E1668	73575-53-8	PCB-67	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	73575-52-7	PCB-68	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB69+49	PCB-69/49	pg/L	N			151	U			50.1	J			42.1	J
E1668	33284-50-3	PCB-7	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	74338-23-1	PCB-73	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	32598-13-3	PCB-77	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	70362-49-1	PCB-78	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	41464-48-6	PCB-79	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	34883-43-7	PCB-8	pg/L	N			11.3	J			38.1	U			13.7	J
E1668	33284-52-5	PCB-80	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	70362-50-4	PCB-81	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-62-4	PCB-82	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	60145-20-2	PCB-83	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	52663-60-2	PCB-84	pg/L	N			75.5	U			12.3	J			76.2	U
E1668	55215-17-3	PCB-88	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	73575-57-2	PCB-89	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	34883-39-1	PCB-9	pg/L	N			37.7	U			38.1	U			38.1	U
E1668	52663-61-3	PCB-92	pg/L	N			75.5	U			76.2	U			76.2	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAA-SW-01		OL-RAA-SW-01		OL-RAB-SW-01		OL-RAB-SW-01		OL-RAB-SW-02		OL-RAB-SW-02	
Field Sample ID					OL-3142-04		OL-3142-04		OL-3142-05		OL-3142-05		OL-3142-06		OL-3142-06	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		0.99 - 0.99		0.99 - 0.99	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	73575-55-0	PCB-94	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	38379-99-6	PCB-95	pg/L	N			19.6	J			28.5	J			23.8	J
E1668	73575-54-9	PCB-96	pg/L	N			75.5	U			76.2	U			76.2	U
E1668	PCB110+115	PCB110+115	pg/L	N			151	U			152	U			152	U
E1668	PCB18+30	PCB18+30	pg/L	N			20.9	J			41.3	J			36.6	J
E1668	PCB183+185	PCB183+185	pg/L	N			151	U			152	U			152	U
E1668	PCB197+200	PCB197+200	pg/L	N			226	U			229	U			229	U
E1668	PCB40+71	PCB40+71	pg/L	N			151	U			30.1	J			24.7	J
E1668	PCB85116117	PCB85+116+117	pg/L	N			226	U			229	U			229	U
E1668	PCB93+100	PCB93+100	pg/L	N			151	U			152	U			152	U
E1668	PCB98+102	PCB98+102	pg/L	N			189	U			190	U			190	U

Location ID					OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
Field Sample ID					OL-3142-07		OL-3142-07		OL-3142-08		OL-3142-08		OL-3142-09		OL-3142-09	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N	0.000026	U			0.000026	U			0.000026	U		
E1631	7439-97-6	MERCURY	ug/l	N	0.00096				0.00085				0.00087			
E1631	7439-97-6	MERCURY	ug/l	Y	0.0002	J			0.0002	J			0.00022	J		
E1668	33146-45-1	10-DiCB	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	74472-36-9	112-PeCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41411-61-4	142-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	68194-15-0	143-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41411-62-5	160-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-43-8	161-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	39635-34-2	162-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-45-0	164-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-46-1	165-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-76-0	203-OcCB	pg/L	N			114	U			113	U			113	U
E1668	52663-58-8	64-TeCB	pg/L	N			26.0	J			25.0	J			27.0	J
E1668	41464-42-0	72-TeCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	31508-00-6	PCB 118	pg/L	N			20.9	J			15.6	J			18.5	J
E1668	2051-24-3	PCB 209	pg/L	N			952	U			943	U			943	U
E1668	35693-99-3	PCB 52	pg/L	N			79.6				87.1				91.7	
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	2051-60-7	PCB-1	pg/L	N			190	U			189	U			189	U
E1668	60145-21-3	PCB-103	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	56558-16-8	PCB-104	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32598-14-4	PCB-105	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70424-69-0	PCB-106/118	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70424-68-9	PCB-107	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB108+124	PCB-108/124	pg/L	N			152	U			151	U			151	U
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N			457	U			453	U			453	U
E1668	2050-67-1	PCB-11	pg/L	N			286	U			283	U			283	U
E1668	39635-32-0	PCB-111	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB11390101	PCB-113/90/101	pg/L	N			229	U			226	U			226	U
E1668	74472-37-0	PCB-114	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB12+13	PCB-12/13	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	68194-12-7	PCB-120	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	56558-18-0	PCB-121	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	76842-07-4	PCB-122	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	65510-44-3	PCB-123	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	57465-28-8	PCB-126	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	39635-33-1	PCB-127	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB128+166	PCB-128/166	pg/L	N			152	U			151	U			151	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
Field Sample ID					OL-3142-07		OL-3142-07		OL-3142-08		OL-3142-08		OL-3142-09		OL-3142-09	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52663-66-8	PCB-130	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	61798-70-7	PCB-131	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38380-05-1	PCB-132	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	35694-04-3	PCB-133	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52704-70-8	PCB-134	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38411-22-2	PCB-136	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	35694-06-5	PCB-137	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB138163129	PCB-138/163/129	pg/L	N			229	U			226	U			226	U
E1668	PCB139+140	PCB-139/140	pg/L	N			152	U			151	U			151	U
E1668	34883-41-5	PCB-14	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	52712-04-6	PCB-141	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	68194-14-9	PCB-144	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-40-5	PCB-145	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	51908-16-8	PCB-146	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB147+149	PCB-147/149	pg/L	N			152	U			151	U			151	U
E1668	74472-41-6	PCB-148	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	2050-68-2	PCB-15	pg/L	N			21.1	J			18.1	J			17.9	J
E1668	68194-08-1	PCB-150	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB151+135	PCB-151/135	pg/L	N			152	U			151	U			151	U
E1668	68194-09-2	PCB-152	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38380-01-7	PCB-153	pg/L	N			16.9	J			14.1	J			75.5	U
E1668	PCB153+168	PCB-153/168	pg/L	N			152	U			151	U			151	U
E1668	60145-22-4	PCB-154	pg/L	N			190	U			189	U			189	U
E1668	33979-03-2	PCB-155	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB156+157	PCB-156/157	pg/L	N			152	U			151	U			151	U
E1668	74472-42-7	PCB-158	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	39635-35-3	PCB-159	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38444-78-9	PCB-16	pg/L	N			16.9	J			15.6	J			15.7	J
E1668	52663-72-6	PCB-167	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32774-16-6	PCB-169	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	37680-66-3	PCB-17	pg/L	N			29.9	J			33.8	J			33.3	J
E1668	35065-30-6	PCB-170	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB171+173	PCB-171/173	pg/L	N			152	U			151	U			151	U
E1668	52663-74-8	PCB-172	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38411-25-5	PCB-174	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	40186-70-7	PCB-175	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-65-7	PCB-176	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-70-4	PCB-177	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-67-9	PCB-178	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-64-6	PCB-179	pg/L	N			76.2	U			75.5	U			75.5	U

Location ID					OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
Field Sample ID					OL-3142-07		OL-3142-07		OL-3142-08		OL-3142-08		OL-3142-09		OL-3142-09	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	PCB180+193	PCB-180/193	pg/L	N			152	U			151	U			151	U
E1668	74472-47-2	PCB-181	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	60145-23-5	PCB-182	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-68-0	PCB-183	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-48-3	PCB-184	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-49-4	PCB-186	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74487-85-7	PCB-188	pg/L	N			190	U			189	U			189	U
E1668	39635-31-9	PCB-189	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38444-73-4	PCB-19	pg/L	N			19.0	J			37.7	U			18.3	J
E1668	41411-64-7	PCB-190	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-50-7	PCB-191	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-51-8	PCB-192	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	35694-08-7	PCB-194	pg/L	N			114	U			113	U			113	U
E1668	52663-78-2	PCB-195	pg/L	N			114	U			113	U			113	U
E1668	42740-50-1	PCB-196/203	pg/L	N			114	U			113	U			113	U
E1668	PCB198+199	PCB-198/199	pg/L	N			229	U			226	U			226	U
E1668	2051-61-8	PCB-2	pg/L	N			190	U			189	U			189	U
E1668	40186-71-8	PCB-201	pg/L	N			381	U			377	U			377	U
E1668	2136-99-4	PCB-202	pg/L	N			114	U			113	U			113	U
E1668	74472-52-9	PCB-204	pg/L	N			114	U			113	U			113	U
E1668	74472-53-0	PCB-205	pg/L	N			114	U			113	U			113	U
E1668	40186-72-9	PCB-206	pg/L	N			114	U			113	U			113	U
E1668	52663-79-3	PCB-207	pg/L	N			114	U			113	U			113	U
E1668	52663-77-1	PCB-208	pg/L	N			114	U			113	U			113	U
E1668	PCB21+33	PCB-21/33	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38444-85-8	PCB-22	pg/L	N			15.8	J			10.3	J			11.1	J
E1668	55720-44-0	PCB-23	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	55702-45-9	PCB-24	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	55712-37-3	PCB-25	pg/L	N			24.3	J			27.4	J			27.3	J
E1668	38444-76-7	PCB-27	pg/L	N			10.8	J			11.3	J			13.7	J
E1668	PCB28+20	PCB-28/20	pg/L	N			62.8	J			56.2	J			55.0	J
E1668	PCB29+26	PCB-29/26	pg/L	N			39.0	J			41.7	J			42.3	J
E1668	2051-62-9	PCB-3	pg/L	N			190	U			189	U			189	U
E1668	16606-02-3	PCB-31	pg/L	N			60.5				67.4				66.3	
E1668	38444-77-8	PCB-32	pg/L	N			29.4	J			34.2	J			34.4	J
E1668	37680-68-5	PCB-34	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	37680-69-6	PCB-35	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	38444-87-0	PCB-36	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	38444-90-5	PCB-37	pg/L	N			10.5	J			7.62	J			7.52	J
E1668	53555-66-1	PCB-38	pg/L	N			38.1	U			37.7	U			37.7	U

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Onondaga Lake (Syracuse NY)

Location ID					OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
Field Sample ID					OL-3142-07		OL-3142-07		OL-3142-08		OL-3142-08		OL-3142-09		OL-3142-09	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-88-1	PCB-39	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	13029-08-8	PCB-4	pg/L	N			43.8				36.3	J			42.7	
E1668	52663-59-9	PCB-41	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	36559-22-5	PCB-42	pg/L	N			24.3	J			26.0	J			75.5	U
E1668	70362-46-8	PCB-43	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N			72.0	J			79.6	J			85.2	J
E1668	70362-45-7	PCB-45	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-47-5	PCB-46	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70362-47-9	PCB-48	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	16605-91-7	PCB-5	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	PCB50+53	PCB-50/53	pg/L	N			286	U			283	U			283	U
E1668	68194-04-7	PCB-51	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	15968-05-5	PCB-54	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74338-24-2	PCB-55	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-43-1	PCB-56	pg/L	N			16.1	J			75.5	U			14.6	J
E1668	70424-67-8	PCB-57	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-49-7	PCB-58	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N			229	U			226	U			226	U
E1668	25569-80-6	PCB-6	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N			51.4	J			302	U			51.5	J
E1668	74472-34-7	PCB-63	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32598-10-0	PCB-66	pg/L	N			32.9	J			28.0	J			28.8	J
E1668	73575-53-8	PCB-67	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	73575-52-7	PCB-68	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB69+49	PCB-69/49	pg/L	N			55.6	J			57.4	J			61.7	J
E1668	33284-50-3	PCB-7	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	74338-23-1	PCB-73	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32598-13-3	PCB-77	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70362-49-1	PCB-78	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-48-6	PCB-79	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	34883-43-7	PCB-8	pg/L	N			16.2	J			37.7	U			37.7	U
E1668	33284-52-5	PCB-80	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70362-50-4	PCB-81	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-62-4	PCB-82	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	60145-20-2	PCB-83	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-60-2	PCB-84	pg/L	N			76.2	U			75.5	U			12.6	J
E1668	55215-17-3	PCB-88	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	73575-57-2	PCB-89	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	34883-39-1	PCB-9	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	52663-61-3	PCB-92	pg/L	N			76.2	U			75.5	U			75.5	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAC-SW-01		OL-RAC-SW-01		OL-RAC-SW-02		OL-RAC-SW-02		OL-RAD-SW-01		OL-RAD-SW-01	
Field Sample ID					OL-3142-07		OL-3142-07		OL-3142-08		OL-3142-08		OL-3142-09		OL-3142-09	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	73575-55-0	PCB-94	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38379-99-6	PCB-95	pg/L	N			30.7	J			40.9	J			75.5	U
E1668	73575-54-9	PCB-96	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB110+115	PCB110+115	pg/L	N			152	U			151	U			151	U
E1668	PCB18+30	PCB18+30	pg/L	N			44.3	J			48.5	J			47.0	J
E1668	PCB183+185	PCB183+185	pg/L	N			152	U			151	U			151	U
E1668	PCB197+200	PCB197+200	pg/L	N			229	U			226	U			226	U
E1668	PCB40+71	PCB40+71	pg/L	N			32.4	J			32.9	J			34.0	J
E1668	PCB85116117	PCB85+116+117	pg/L	N			229	U			226	U			226	U
E1668	PCB93+100	PCB93+100	pg/L	N			152	U			151	U			151	U
E1668	PCB98+102	PCB98+102	pg/L	N			190	U			189	U			189	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
Field Sample ID					OL-3142-10		OL-3142-10		OL-3142-11		OL-3142-11		OL-3142-12		OL-3142-12	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N	0.000026	U			0.000026	U			0.000026	U		
E1631	7439-97-6	MERCURY	ug/l	N	0.00069				0.00058				0.00288			
E1631	7439-97-6	MERCURY	ug/l	Y	0.0002	J			0.00022	J			0.0004	J		
E1668	33146-45-1	10-DiCB	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	74472-36-9	112-PeCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41411-61-4	142-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	68194-15-0	143-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41411-62-5	160-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-43-8	161-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	39635-34-2	162-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-45-0	164-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-46-1	165-HxCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-76-0	203-OcCB	pg/L	N			114	U			113	U			113	U
E1668	52663-58-8	64-TeCB	pg/L	N			22.7	J			19.7	J			21.7	J
E1668	41464-42-0	72-TeCB	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	31508-00-6	PCB 118	pg/L	N			14.4	J			75.5	U			38.1	J
E1668	2051-24-3	PCB 209	pg/L	N			952	U			943	U			943	U
E1668	35693-99-3	PCB 52	pg/L	N			77.7				70.4	J			76.2	
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	2051-60-7	PCB-1	pg/L	N			190	U			189	U			189	U
E1668	60145-21-3	PCB-103	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	56558-16-8	PCB-104	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32598-14-4	PCB-105	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70424-69-0	PCB-106/118	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70424-68-9	PCB-107	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB108+124	PCB-108/124	pg/L	N			152	U			151	U			151	U
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N			457	U			453	U			453	U
E1668	2050-67-1	PCB-11	pg/L	N			286	U			283	U			283	U
E1668	39635-32-0	PCB-111	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB11390101	PCB-113/90/101	pg/L	N			229	U			226	U			45.7	J
E1668	74472-37-0	PCB-114	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB12+13	PCB-12/13	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	68194-12-7	PCB-120	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	56558-18-0	PCB-121	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	76842-07-4	PCB-122	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	65510-44-3	PCB-123	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	57465-28-8	PCB-126	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	39635-33-1	PCB-127	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB128+166	PCB-128/166	pg/L	N			152	U			151	U			151	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
Field Sample ID					OL-3142-10		OL-3142-10		OL-3142-11		OL-3142-11		OL-3142-12		OL-3142-12	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52663-66-8	PCB-130	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	61798-70-7	PCB-131	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38380-05-1	PCB-132	pg/L	N			76.2	U			75.5	U			16.1	J
E1668	35694-04-3	PCB-133	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52704-70-8	PCB-134	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38411-22-2	PCB-136	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	35694-06-5	PCB-137	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB138163129	PCB-138/163/129	pg/L	N			229	U			226	U			60.7	J
E1668	PCB139+140	PCB-139/140	pg/L	N			152	U			151	U			151	U
E1668	34883-41-5	PCB-14	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	52712-04-6	PCB-141	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	68194-14-9	PCB-144	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-40-5	PCB-145	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	51908-16-8	PCB-146	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB147+149	PCB-147/149	pg/L	N			152	U			151	U			47.5	J
E1668	74472-41-6	PCB-148	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	2050-68-2	PCB-15	pg/L	N			16.4	J			37.7	U			26.8	J
E1668	68194-08-1	PCB-150	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB151+135	PCB-151/135	pg/L	N			152	U			151	U			151	U
E1668	68194-09-2	PCB-152	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38380-01-7	PCB-153	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB153+168	PCB-153/168	pg/L	N			152	U			151	U			41.8	J
E1668	60145-22-4	PCB-154	pg/L	N			190	U			189	U			189	U
E1668	33979-03-2	PCB-155	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB156+157	PCB-156/157	pg/L	N			152	U			151	U			151	U
E1668	74472-42-7	PCB-158	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	39635-35-3	PCB-159	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38444-78-9	PCB-16	pg/L	N			38.1	U			13.8	J			14.7	J
E1668	52663-72-6	PCB-167	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32774-16-6	PCB-169	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	37680-66-3	PCB-17	pg/L	N			28.6	J			26.8	J			37.7	U
E1668	35065-30-6	PCB-170	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB171+173	PCB-171/173	pg/L	N			152	U			151	U			151	U
E1668	52663-74-8	PCB-172	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38411-25-5	PCB-174	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	40186-70-7	PCB-175	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-65-7	PCB-176	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-70-4	PCB-177	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-67-9	PCB-178	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-64-6	PCB-179	pg/L	N			76.2	U			75.5	U			75.5	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
Field Sample ID					OL-3142-10		OL-3142-10		OL-3142-11		OL-3142-11		OL-3142-12		OL-3142-12	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	PCB180+193	PCB-180/193	pg/L	N			152	U			151	U			31.2	J
E1668	74472-47-2	PCB-181	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	60145-23-5	PCB-182	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-68-0	PCB-183	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-48-3	PCB-184	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-49-4	PCB-186	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74487-85-7	PCB-188	pg/L	N			190	U			189	U			189	U
E1668	39635-31-9	PCB-189	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38444-73-4	PCB-19	pg/L	N			15.8	J			14.5	J			10.3	J
E1668	41411-64-7	PCB-190	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-50-7	PCB-191	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74472-51-8	PCB-192	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	35694-08-7	PCB-194	pg/L	N			114	U			113	U			113	U
E1668	52663-78-2	PCB-195	pg/L	N			114	U			113	U			113	U
E1668	42740-50-1	PCB-196/203	pg/L	N			114	U			113	U			113	U
E1668	PCB198+199	PCB-198/199	pg/L	N			229	U			226	U			226	U
E1668	2051-61-8	PCB-2	pg/L	N			190	U			189	U			189	U
E1668	40186-71-8	PCB-201	pg/L	N			381	U			377	U			377	U
E1668	2136-99-4	PCB-202	pg/L	N			114	U			113	U			113	U
E1668	74472-52-9	PCB-204	pg/L	N			114	U			113	U			113	U
E1668	74472-53-0	PCB-205	pg/L	N			114	U			113	U			113	U
E1668	40186-72-9	PCB-206	pg/L	N			114	U			113	U			113	U
E1668	52663-79-3	PCB-207	pg/L	N			114	U			113	U			113	U
E1668	52663-77-1	PCB-208	pg/L	N			114	U			113	U			113	U
E1668	PCB21+33	PCB-21/33	pg/L	N			76.2	U			75.5	U			15.8	J
E1668	38444-85-8	PCB-22	pg/L	N			9.96	J			7.86	J			18.7	J
E1668	55720-44-0	PCB-23	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	55702-45-9	PCB-24	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	55712-37-3	PCB-25	pg/L	N			23.4	J			20.0	J			20.8	J
E1668	38444-76-7	PCB-27	pg/L	N			12.5	J			9.84	J			6.72	J
E1668	PCB28+20	PCB-28/20	pg/L	N			49.9	J			40.8	J			64.8	J
E1668	PCB29+26	PCB-29/26	pg/L	N			39.7	J			31.4	J			32.1	J
E1668	2051-62-9	PCB-3	pg/L	N			190	U			189	U			189	U
E1668	16606-02-3	PCB-31	pg/L	N			59.4				52.7				79.2	
E1668	38444-77-8	PCB-32	pg/L	N			33.3	J			28.0	J			24.2	J
E1668	37680-68-5	PCB-34	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	37680-69-6	PCB-35	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	38444-87-0	PCB-36	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	38444-90-5	PCB-37	pg/L	N			7.17	J			7.13	J			16.4	J
E1668	53555-66-1	PCB-38	pg/L	N			38.1	U			37.7	U			37.7	U

00 SYR Water
Onondaga Lake (Syracuse NY)

		Location ID			OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
		Field Sample ID			OL-3142-10		OL-3142-10		OL-3142-11		OL-3142-11		OL-3142-12		OL-3142-12	
		Depth (ft)			1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
		Date Sampled			11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
		SDG			8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
		Matrix			WATER		WATER		WATER		WATER		WATER		WATER	
		Purpose			REG		REG		REG		REG		REG		REG	
		Type			W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	38444-88-1	PCB-39	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	13029-08-8	PCB-4	pg/L	N			38.1	U			35.4	J			37.7	U
E1668	52663-59-9	PCB-41	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	36559-22-5	PCB-42	pg/L	N			22.7	J			18.6	J			19.2	J
E1668	70362-46-8	PCB-43	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N			68.2	J			58.8	J			60.0	J
E1668	70362-45-7	PCB-45	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-47-5	PCB-46	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70362-47-9	PCB-48	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	16605-91-7	PCB-5	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	PCB50+53	PCB-50/53	pg/L	N			286	U			283	U			283	U
E1668	68194-04-7	PCB-51	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	15968-05-5	PCB-54	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	74338-24-2	PCB-55	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-43-1	PCB-56	pg/L	N			11.7	J			75.5	U			17.5	J
E1668	70424-67-8	PCB-57	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-49-7	PCB-58	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N			229	U			226	U			226	U
E1668	25569-80-6	PCB-6	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N			305	U			302	U			71.2	J
E1668	74472-34-7	PCB-63	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32598-10-0	PCB-66	pg/L	N			25.5	J			22.1	J			39.6	J
E1668	73575-53-8	PCB-67	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	73575-52-7	PCB-68	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB69+49	PCB-69/49	pg/L	N			52.1	J			41.9	J			44.4	J
E1668	33284-50-3	PCB-7	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	74338-23-1	PCB-73	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	32598-13-3	PCB-77	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70362-49-1	PCB-78	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	41464-48-6	PCB-79	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	34883-43-7	PCB-8	pg/L	N			10.9	J			37.7	U			37.7	U
E1668	33284-52-5	PCB-80	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	70362-50-4	PCB-81	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-62-4	PCB-82	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	60145-20-2	PCB-83	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	52663-60-2	PCB-84	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	55215-17-3	PCB-88	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	73575-57-2	PCB-89	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	34883-39-1	PCB-9	pg/L	N			38.1	U			37.7	U			37.7	U
E1668	52663-61-3	PCB-92	pg/L	N			76.2	U			75.5	U			75.5	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAD-SW-02		OL-RAD-SW-02		OL-RAE-SW-01		OL-RAE-SW-01		OL-RAE-SW-02		OL-RAE-SW-02	
Field Sample ID					OL-3142-10		OL-3142-10		OL-3142-11		OL-3142-11		OL-3142-12		OL-3142-12	
Depth (ft)					1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65		1.65 - 1.65	
Date Sampled					11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018		11/08/2018	
SDG					8K00376		ONO72		8K00376		ONO72		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		REG		REG		REG		REG	
Type					W-SW		W-SW		W-SW		W-SW		W-SW		W-SW	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	73575-55-0	PCB-94	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	38379-99-6	PCB-95	pg/L	N			38.8	J			31.7	J			75.5	U
E1668	73575-54-9	PCB-96	pg/L	N			76.2	U			75.5	U			75.5	U
E1668	PCB110+115	PCB110+115	pg/L	N			152	U			151	U			57.9	J
E1668	PCB18+30	PCB18+30	pg/L	N			47.2	J			40.5	J			36.5	J
E1668	PCB183+185	PCB183+185	pg/L	N			152	U			151	U			151	U
E1668	PCB197+200	PCB197+200	pg/L	N			229	U			226	U			226	U
E1668	PCB40+71	PCB40+71	pg/L	N			28.2	J			23.8	J			24.4	J
E1668	PCB85116117	PCB85+116+117	pg/L	N			229	U			226	U			226	U
E1668	PCB93+100	PCB93+100	pg/L	N			152	U			151	U			151	U
E1668	PCB98+102	PCB98+102	pg/L	N			190	U			189	U			189	U

00 SYR Water
Onondaga Lake (Syracuse NY)

		Location ID			OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
		Field Sample ID			OL-3142-13		OL-3142-13		OL-3073-EB1		OL-3073-EB1		OL-3073-EB2		OL-3073-EB2	
		Depth (ft)			1.65 - 1.65		1.65 - 1.65									
		Date Sampled			11/08/2018		11/08/2018		11/02/2018		11/02/2018		11/02/2018		11/02/2018	
		SDG			8K00376		ONO72		8K00097		ONO71		8K00097		ONO71	
		Matrix			WATER		WATER		WATER		WATER		WATER		WATER	
		Purpose			REG		REG		EB		EB		EB		EB	
		Type			W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1630	22967-92-6	METHYL MERCURY	ug/l	N	0.000045	J			0.000052				0.000046	J		
E1631	7439-97-6	MERCURY	ug/l	N	0.00235				0.00253				0.00624			
E1631	7439-97-6	MERCURY	ug/l	Y	0.00032	J										
E1668	33146-45-1	10-DiCB	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	74472-36-9	112-PeCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	41411-61-4	142-HxCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	68194-15-0	143-HxCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	41411-62-5	160-HxCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74472-43-8	161-HxCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	39635-34-2	162-HxCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74472-45-0	164-HxCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74472-46-1	165-HxCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N			22.7	J			76.9	U			76.2	U
E1668	52663-76-0	203-OcCB	pg/L	N			113	U			115	U			114	U
E1668	52663-58-8	64-TeCB	pg/L	N			126				76.9	U			18.2	J
E1668	41464-42-0	72-TeCB	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	31508-00-6	PCB 118	pg/L	N			83.4				76.9	U			76.2	U
E1668	2051-24-3	PCB 209	pg/L	N			943	U			962	U			952	U
E1668	35693-99-3	PCB 52	pg/L	N			411				76.9	U			76.2	U
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N			30.6	J			76.9	U			76.2	U
E1668	2051-60-7	PCB-1	pg/L	N			189	U			192	U			190	U
E1668	60145-21-3	PCB-103	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	56558-16-8	PCB-104	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	32598-14-4	PCB-105	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	70424-69-0	PCB-106/118	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	70424-68-9	PCB-107	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB108+124	PCB-108/124	pg/L	N			151	U			154	U			152	U
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N			453	U			462	U			457	U
E1668	2050-67-1	PCB-11	pg/L	N			283	U			288	U			286	U
E1668	39635-32-0	PCB-111	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB11390101	PCB-113/90/101	pg/L	N			111	J			231	U			229	U
E1668	74472-37-0	PCB-114	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB12+13	PCB-12/13	pg/L	N			36.3	J			76.9	U			76.2	U
E1668	68194-12-7	PCB-120	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	56558-18-0	PCB-121	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	76842-07-4	PCB-122	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	65510-44-3	PCB-123	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	57465-28-8	PCB-126	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	39635-33-1	PCB-127	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB128+166	PCB-128/166	pg/L	N			151	U			154	U			152	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3142-13		OL-3142-13		OL-3073-EB1		OL-3073-EB1		OL-3073-EB2		OL-3073-EB2	
Depth (ft)					1.65 - 1.65		1.65 - 1.65									
Date Sampled					11/08/2018		11/08/2018		11/02/2018		11/02/2018		11/02/2018		11/02/2018	
SDG					8K00376		ONO72		8K00097		ONO71		8K00097		ONO71	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		EB		EB		EB		EB	
Type					W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	52663-66-8	PCB-130	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	61798-70-7	PCB-131	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	38380-05-1	PCB-132	pg/L	N			36.2	J			76.9	U			76.2	U
E1668	35694-04-3	PCB-133	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	52704-70-8	PCB-134	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	38411-22-2	PCB-136	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	35694-06-5	PCB-137	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB138163129	PCB-138/163/129	pg/L	N			116	J			231	U			229	U
E1668	PCB139+140	PCB-139/140	pg/L	N			151	U			154	U			152	U
E1668	34883-41-5	PCB-14	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	52712-04-6	PCB-141	pg/L	N			25.6	J			76.9	U			76.2	U
E1668	68194-14-9	PCB-144	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74472-40-5	PCB-145	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	51908-16-8	PCB-146	pg/L	N			18.2	J			76.9	U			76.2	U
E1668	PCB147+149	PCB-147/149	pg/L	N			103	J			154	U			152	U
E1668	74472-41-6	PCB-148	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	2050-68-2	PCB-15	pg/L	N			96.7				38.5	U			38.1	U
E1668	68194-08-1	PCB-150	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB151+135	PCB-151/135	pg/L	N			151	U			154	U			152	U
E1668	68194-09-2	PCB-152	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	38380-01-7	PCB-153	pg/L	N			64.9	J			76.9	U			76.2	U
E1668	PCB153+168	PCB-153/168	pg/L	N			90.3	J			154	U			152	U
E1668	60145-22-4	PCB-154	pg/L	N			189	U			192	U			190	U
E1668	33979-03-2	PCB-155	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB156+157	PCB-156/157	pg/L	N			151	U			154	U			152	U
E1668	74472-42-7	PCB-158	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	39635-35-3	PCB-159	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	38444-78-9	PCB-16	pg/L	N			42.8				7.47	J			10.5	J
E1668	52663-72-6	PCB-167	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	32774-16-6	PCB-169	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	37680-66-3	PCB-17	pg/L	N			121				38.5	U			38.1	U
E1668	35065-30-6	PCB-170	pg/L	N			30.4	J			76.9	U			76.2	U
E1668	PCB171+173	PCB-171/173	pg/L	N			151	U			154	U			152	U
E1668	52663-74-8	PCB-172	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	38411-25-5	PCB-174	pg/L	N			33.8	J			76.9	U			76.2	U
E1668	40186-70-7	PCB-175	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	52663-65-7	PCB-176	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	52663-70-4	PCB-177	pg/L	N			18.4	J			76.9	U			76.2	U
E1668	52663-67-9	PCB-178	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	52663-64-6	PCB-179	pg/L	N			75.5	U			76.9	U			76.2	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3142-13		OL-3142-13		OL-3073-EB1		OL-3073-EB1		OL-3073-EB2		OL-3073-EB2	
Depth (ft)					1.65 - 1.65		1.65 - 1.65									
Date Sampled					11/08/2018		11/08/2018		11/02/2018		11/02/2018		11/02/2018		11/02/2018	
SDG					8K00376		ONO72		8K00097		ONO71		8K00097		ONO71	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		EB		EB		EB		EB	
Type					W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	PCB180+193	PCB-180/193	pg/L	N			74.5	J			154	U			152	U
E1668	74472-47-2	PCB-181	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	60145-23-5	PCB-182	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	52663-68-0	PCB-183	pg/L	N			40.4	J			76.9	U			76.2	U
E1668	74472-48-3	PCB-184	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74472-49-4	PCB-186	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74487-85-7	PCB-188	pg/L	N			189	U			192	U			190	U
E1668	39635-31-9	PCB-189	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	38444-73-4	PCB-19	pg/L	N			45.5				38.5	U			38.1	U
E1668	41411-64-7	PCB-190	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74472-50-7	PCB-191	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74472-51-8	PCB-192	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	35694-08-7	PCB-194	pg/L	N			113	U			115	U			114	U
E1668	52663-78-2	PCB-195	pg/L	N			113	U			115	U			114	U
E1668	42740-50-1	PCB-196/203	pg/L	N			113	U			115	U			114	U
E1668	PCB198+199	PCB-198/199	pg/L	N			226	U			231	U			229	U
E1668	2051-61-8	PCB-2	pg/L	N			189	U			192	U			190	U
E1668	40186-71-8	PCB-201	pg/L	N			377	U			385	U			381	U
E1668	2136-99-4	PCB-202	pg/L	N			113	U			115	U			114	U
E1668	74472-52-9	PCB-204	pg/L	N			113	U			115	U			114	U
E1668	74472-53-0	PCB-205	pg/L	N			113	U			115	U			114	U
E1668	40186-72-9	PCB-206	pg/L	N			113	U			115	U			114	U
E1668	52663-79-3	PCB-207	pg/L	N			113	U			115	U			114	U
E1668	52663-77-1	PCB-208	pg/L	N			113	U			115	U			114	U
E1668	PCB21+33	PCB-21/33	pg/L	N			75.5	U			15.0	J			76.2	U
E1668	38444-85-8	PCB-22	pg/L	N			66.8				9.55	J			24.3	J
E1668	55720-44-0	PCB-23	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	55702-45-9	PCB-24	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	55712-37-3	PCB-25	pg/L	N			165				38.5	U			38.1	U
E1668	38444-76-7	PCB-27	pg/L	N			46.1				38.5	U			38.1	U
E1668	PCB28+20	PCB-28/20	pg/L	N			335				25.9	J			83.1	
E1668	PCB29+26	PCB-29/26	pg/L	N			225				76.9	U			76.2	U
E1668	2051-62-9	PCB-3	pg/L	N			189	U			192	U			190	U
E1668	16606-02-3	PCB-31	pg/L	N			359				21.1	J			65.0	
E1668	38444-77-8	PCB-32	pg/L	N			143				38.5	U			38.1	U
E1668	37680-68-5	PCB-34	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	37680-69-6	PCB-35	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	38444-87-0	PCB-36	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	38444-90-5	PCB-37	pg/L	N			33.5	J			7.97	J			15.1	J
E1668	53555-66-1	PCB-38	pg/L	N			37.7	U			38.5	U			38.1	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC
Field Sample ID					OL-3142-13		OL-3142-13		OL-3073-EB1		OL-3073-EB1		OL-3073-EB2		OL-3073-EB2
Depth (ft)					1.65 - 1.65		1.65 - 1.65								
Date Sampled					11/08/2018		11/08/2018		11/02/2018		11/02/2018		11/02/2018		11/02/2018
SDG					8K00376		ONO72		8K00097		ONO71		8K00097		ONO71
Matrix					WATER		WATER		WATER		WATER		WATER		WATER
Purpose					REG		REG		EB		EB		EB		EB
Type					W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER
Method	Parameter Code	Parameter Name	Units	Filtered											
E1668	38444-88-1	PCB-39	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	13029-08-8	PCB-4	pg/L	N			71.8				38.5	U			38.1	U
E1668	52663-59-9	PCB-41	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	36559-22-5	PCB-42	pg/L	N			131				76.9	U			76.2	U
E1668	70362-46-8	PCB-43	pg/L	N			14.3	J			76.9	U			76.2	U
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N			371				231	U			229	U
E1668	70362-45-7	PCB-45	pg/L	N			28.5	J			76.9	U			76.2	U
E1668	41464-47-5	PCB-46	pg/L	N			29.9	J			76.9	U			76.2	U
E1668	70362-47-9	PCB-48	pg/L	N			19.7	J			76.9	U			76.2	U
E1668	16605-91-7	PCB-5	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	PCB50+53	PCB-50/53	pg/L	N			283	U			288	U			286	U
E1668	68194-04-7	PCB-51	pg/L	N			36.4	J			76.9	U			76.2	U
E1668	15968-05-5	PCB-54	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	74338-24-2	PCB-55	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	41464-43-1	PCB-56	pg/L	N			63.5	J			76.9	U			76.2	U
E1668	70424-67-8	PCB-57	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	41464-49-7	PCB-58	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N			226	U			231	U			229	U
E1668	25569-80-6	PCB-6	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N			227	J			308	U			72.0	J
E1668	74472-34-7	PCB-63	pg/L	N			15.1	J			76.9	U			76.2	U
E1668	32598-10-0	PCB-66	pg/L	N			167				76.9	U			34.8	J
E1668	73575-53-8	PCB-67	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	73575-52-7	PCB-68	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB69+49	PCB-69/49	pg/L	N			312				154	U			152	U
E1668	33284-50-3	PCB-7	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	74338-23-1	PCB-73	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	32598-13-3	PCB-77	pg/L	N			17.5	J			76.9	U			76.2	U
E1668	70362-49-1	PCB-78	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	41464-48-6	PCB-79	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	34883-43-7	PCB-8	pg/L	N			37.7	U			15.4	J			22.3	J
E1668	33284-52-5	PCB-80	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	70362-50-4	PCB-81	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	52663-62-4	PCB-82	pg/L	N			17.7	J			76.9	U			76.2	U
E1668	60145-20-2	PCB-83	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	52663-60-2	PCB-84	pg/L	N			51.0	J			76.9	U			76.2	U
E1668	55215-17-3	PCB-88	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	73575-57-2	PCB-89	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	34883-39-1	PCB-9	pg/L	N			37.7	U			38.5	U			38.1	U
E1668	52663-61-3	PCB-92	pg/L	N			36.1	J			76.9	U			76.2	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					OL-RAE-SW-03		OL-RAE-SW-03		FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3142-13		OL-3142-13		OL-3073-EB1		OL-3073-EB1		OL-3073-EB2		OL-3073-EB2	
Depth (ft)					1.65 - 1.65		1.65 - 1.65									
Date Sampled					11/08/2018		11/08/2018		11/02/2018		11/02/2018		11/02/2018		11/02/2018	
SDG					8K00376		ONO72		8K00097		ONO71		8K00097		ONO71	
Matrix					WATER		WATER		WATER		WATER		WATER		WATER	
Purpose					REG		REG		EB		EB		EB		EB	
Type					W-SW		W-SW		BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered												
E1668	73575-55-0	PCB-94	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	38379-99-6	PCB-95	pg/L	N			175				76.9	U			76.2	U
E1668	73575-54-9	PCB-96	pg/L	N			75.5	U			76.9	U			76.2	U
E1668	PCB110+115	PCB110+115	pg/L	N			187				154	U			152	U
E1668	PCB18+30	PCB18+30	pg/L	N			159				15.3	J			17.8	J
E1668	PCB183+185	PCB183+185	pg/L	N			151	U			154	U			152	U
E1668	PCB197+200	PCB197+200	pg/L	N			226	U			231	U			229	U
E1668	PCB40+71	PCB40+71	pg/L	N			162				154	U			152	U
E1668	PCB85116117	PCB85+116+117	pg/L	N			226	U			231	U			229	U
E1668	PCB93+100	PCB93+100	pg/L	N			151	U			154	U			152	U
E1668	PCB98+102	PCB98+102	pg/L	N			189	U			192	U			190	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3073-FB		OL-3073-FB		OL-3142-FB1		OL-3142-FB1	
Depth (ft)												
Date Sampled					11/02/2018		11/02/2018		11/08/2018		11/08/2018	
SDG					8K00097		ONO71		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER	
Purpose					FB		FB		FB		FB	
Type					BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered								
E1630	22967-92-6	METHYL MERCURY	ug/l	N	0.000026	U			0.000026	U		
E1631	7439-97-6	MERCURY	ug/l	N	0.00086				0.00012	J		
E1631	7439-97-6	MERCURY	ug/l	Y					0.0001	J		
E1668	33146-45-1	10-DiCB	pg/L	N			39.6	U			41.6	U
E1668	74472-36-9	112-PeCB	pg/L	N			79.2	U			83.2	U
E1668	41411-61-4	142-HxCB	pg/L	N			79.2	U			83.2	U
E1668	68194-15-0	143-HxCB	pg/L	N			79.2	U			83.2	U
E1668	41411-62-5	160-HxCB	pg/L	N			79.2	U			83.2	U
E1668	74472-43-8	161-HxCB	pg/L	N			79.2	U			83.2	U
E1668	39635-34-2	162-HxCB	pg/L	N			79.2	U			83.2	U
E1668	74472-45-0	164-HxCB	pg/L	N			79.2	U			83.2	U
E1668	74472-46-1	165-HxCB	pg/L	N			79.2	U			83.2	U
E1668	33025-41-1	2,3',4,4'-TETRACHLOROBIPHENYL	pg/L	N			79.2	U			83.2	U
E1668	52663-76-0	203-OcCB	pg/L	N			119	U			125	U
E1668	52663-58-8	64-TeCB	pg/L	N			79.2	U			83.2	U
E1668	41464-42-0	72-TeCB	pg/L	N			79.2	U			83.2	U
E1668	31508-00-6	PCB 118	pg/L	N			79.2	U			83.2	U
E1668	2051-24-3	PCB 209	pg/L	N			990	U			1040	U
E1668	35693-99-3	PCB 52	pg/L	N			79.2	U			83.2	U
E1668	68194-05-8	PCB 91 (BZ)	pg/L	N			79.2	U			83.2	U
E1668	2051-60-7	PCB-1	pg/L	N			198	U			208	U
E1668	60145-21-3	PCB-103	pg/L	N			79.2	U			83.2	U
E1668	56558-16-8	PCB-104	pg/L	N			79.2	U			83.2	U
E1668	32598-14-4	PCB-105	pg/L	N			79.2	U			83.2	U
E1668	70424-69-0	PCB-106/118	pg/L	N			79.2	U			83.2	U
E1668	70424-68-9	PCB-107	pg/L	N			79.2	U			83.2	U
E1668	PCB108+124	PCB-108/124	pg/L	N			158	U			166	U
E1668	PCB10911986	PCB-109/119/86/97/125/87	pg/L	N			475	U			499	U
E1668	2050-67-1	PCB-11	pg/L	N			297	U			312	U
E1668	39635-32-0	PCB-111	pg/L	N			79.2	U			83.2	U
E1668	PCB11390101	PCB-113/90/101	pg/L	N			238	U			249	U
E1668	74472-37-0	PCB-114	pg/L	N			79.2	U			83.2	U
E1668	PCB12+13	PCB-12/13	pg/L	N			79.2	U			83.2	U
E1668	68194-12-7	PCB-120	pg/L	N			79.2	U			83.2	U
E1668	56558-18-0	PCB-121	pg/L	N			79.2	U			83.2	U
E1668	76842-07-4	PCB-122	pg/L	N			79.2	U			83.2	U
E1668	65510-44-3	PCB-123	pg/L	N			79.2	U			83.2	U
E1668	57465-28-8	PCB-126	pg/L	N			79.2	U			83.2	U
E1668	39635-33-1	PCB-127	pg/L	N			79.2	U			83.2	U
E1668	PCB128+166	PCB-128/166	pg/L	N			158	U			166	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3073-FB		OL-3073-FB		OL-3142-FB1		OL-3142-FB1	
Depth (ft)												
Date Sampled					11/02/2018		11/02/2018		11/08/2018		11/08/2018	
SDG					8K00097		ONO71		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER	
Purpose					FB		FB		FB		FB	
Type					BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered								
E1668	52663-66-8	PCB-130	pg/L	N			79.2	U			83.2	U
E1668	61798-70-7	PCB-131	pg/L	N			79.2	U			83.2	U
E1668	38380-05-1	PCB-132	pg/L	N			79.2	U			83.2	U
E1668	35694-04-3	PCB-133	pg/L	N			79.2	U			83.2	U
E1668	52704-70-8	PCB-134	pg/L	N			79.2	U			83.2	U
E1668	38411-22-2	PCB-136	pg/L	N			79.2	U			83.2	U
E1668	35694-06-5	PCB-137	pg/L	N			79.2	U			83.2	U
E1668	PCB138163129	PCB-138/163/129	pg/L	N			238	U			249	U
E1668	PCB139+140	PCB-139/140	pg/L	N			158	U			166	U
E1668	34883-41-5	PCB-14	pg/L	N			39.6	U			41.6	U
E1668	52712-04-6	PCB-141	pg/L	N			79.2	U			83.2	U
E1668	68194-14-9	PCB-144	pg/L	N			79.2	U			83.2	U
E1668	74472-40-5	PCB-145	pg/L	N			79.2	U			83.2	U
E1668	51908-16-8	PCB-146	pg/L	N			79.2	U			83.2	U
E1668	PCB147+149	PCB-147/149	pg/L	N			158	U			166	U
E1668	74472-41-6	PCB-148	pg/L	N			79.2	U			83.2	U
E1668	2050-68-2	PCB-15	pg/L	N			39.6	U			41.6	U
E1668	68194-08-1	PCB-150	pg/L	N			79.2	U			83.2	U
E1668	PCB151+135	PCB-151/135	pg/L	N			158	U			166	U
E1668	68194-09-2	PCB-152	pg/L	N			79.2	U			83.2	U
E1668	38380-01-7	PCB-153	pg/L	N			79.2	U			83.2	U
E1668	PCB153+168	PCB-153/168	pg/L	N			158	U			166	U
E1668	60145-22-4	PCB-154	pg/L	N			198	U			208	U
E1668	33979-03-2	PCB-155	pg/L	N			79.2	U			83.2	U
E1668	PCB156+157	PCB-156/157	pg/L	N			158	U			166	U
E1668	74472-42-7	PCB-158	pg/L	N			79.2	U			83.2	U
E1668	39635-35-3	PCB-159	pg/L	N			79.2	U			83.2	U
E1668	38444-78-9	PCB-16	pg/L	N			39.6	U			4.28	J
E1668	52663-72-6	PCB-167	pg/L	N			79.2	U			83.2	U
E1668	32774-16-6	PCB-169	pg/L	N			79.2	U			83.2	U
E1668	37680-66-3	PCB-17	pg/L	N			39.6	U			41.6	U
E1668	35065-30-6	PCB-170	pg/L	N			79.2	U			83.2	U
E1668	PCB171+173	PCB-171/173	pg/L	N			158	U			166	U
E1668	52663-74-8	PCB-172	pg/L	N			79.2	U			83.2	U
E1668	38411-25-5	PCB-174	pg/L	N			79.2	U			83.2	U
E1668	40186-70-7	PCB-175	pg/L	N			79.2	U			83.2	U
E1668	52663-65-7	PCB-176	pg/L	N			79.2	U			83.2	U
E1668	52663-70-4	PCB-177	pg/L	N			79.2	U			83.2	U
E1668	52663-67-9	PCB-178	pg/L	N			79.2	U			83.2	U
E1668	52663-64-6	PCB-179	pg/L	N			79.2	U			83.2	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3073-FB		OL-3073-FB		OL-3142-FB1		OL-3142-FB1	
Depth (ft)												
Date Sampled					11/02/2018		11/02/2018		11/08/2018		11/08/2018	
SDG					8K00097		ONO71		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER	
Purpose					FB		FB		FB		FB	
Type					BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered								
E1668	PCB180+193	PCB-180/193	pg/L	N			158	U			166	U
E1668	74472-47-2	PCB-181	pg/L	N			79.2	U			83.2	U
E1668	60145-23-5	PCB-182	pg/L	N			79.2	U			83.2	U
E1668	52663-68-0	PCB-183	pg/L	N			79.2	U			83.2	U
E1668	74472-48-3	PCB-184	pg/L	N			79.2	U			83.2	U
E1668	74472-49-4	PCB-186	pg/L	N			79.2	U			83.2	U
E1668	74487-85-7	PCB-188	pg/L	N			198	U			208	U
E1668	39635-31-9	PCB-189	pg/L	N			79.2	U			83.2	U
E1668	38444-73-4	PCB-19	pg/L	N			39.6	U			41.6	U
E1668	41411-64-7	PCB-190	pg/L	N			79.2	U			83.2	U
E1668	74472-50-7	PCB-191	pg/L	N			79.2	U			83.2	U
E1668	74472-51-8	PCB-192	pg/L	N			79.2	U			83.2	U
E1668	35694-08-7	PCB-194	pg/L	N			119	U			125	U
E1668	52663-78-2	PCB-195	pg/L	N			119	U			125	U
E1668	42740-50-1	PCB-196/203	pg/L	N			119	U			125	U
E1668	PCB198+199	PCB-198/199	pg/L	N			238	U			249	U
E1668	2051-61-8	PCB-2	pg/L	N			198	U			208	U
E1668	40186-71-8	PCB-201	pg/L	N			396	U			416	U
E1668	2136-99-4	PCB-202	pg/L	N			119	U			125	U
E1668	74472-52-9	PCB-204	pg/L	N			119	U			125	U
E1668	74472-53-0	PCB-205	pg/L	N			119	U			125	U
E1668	40186-72-9	PCB-206	pg/L	N			119	U			125	U
E1668	52663-79-3	PCB-207	pg/L	N			119	U			125	U
E1668	52663-77-1	PCB-208	pg/L	N			119	U			125	U
E1668	PCB21+33	PCB-21/33	pg/L	N			14.6	J			83.2	U
E1668	38444-85-8	PCB-22	pg/L	N			8.76	J			41.6	U
E1668	55720-44-0	PCB-23	pg/L	N			39.6	U			41.6	U
E1668	55702-45-9	PCB-24	pg/L	N			39.6	U			41.6	U
E1668	55712-37-3	PCB-25	pg/L	N			39.6	U			41.6	U
E1668	38444-76-7	PCB-27	pg/L	N			39.6	U			41.6	U
E1668	PCB28+20	PCB-28/20	pg/L	N			24.4	J			83.2	U
E1668	PCB29+26	PCB-29/26	pg/L	N			79.2	U			83.2	U
E1668	2051-62-9	PCB-3	pg/L	N			198	U			208	U
E1668	16606-02-3	PCB-31	pg/L	N			21.7	J			41.6	U
E1668	38444-77-8	PCB-32	pg/L	N			5.11	J			41.6	U
E1668	37680-68-5	PCB-34	pg/L	N			39.6	U			41.6	U
E1668	37680-69-6	PCB-35	pg/L	N			39.6	U			41.6	U
E1668	38444-87-0	PCB-36	pg/L	N			39.6	U			41.6	U
E1668	38444-90-5	PCB-37	pg/L	N			7.55	J			41.6	U
E1668	53555-66-1	PCB-38	pg/L	N			39.6	U			41.6	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3073-FB		OL-3073-FB		OL-3142-FB1		OL-3142-FB1	
Depth (ft)												
Date Sampled					11/02/2018		11/02/2018		11/08/2018		11/08/2018	
SDG					8K00097		ONO71		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER	
Purpose					FB		FB		FB		FB	
Type					BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered								
E1668	38444-88-1	PCB-39	pg/L	N			39.6	U			41.6	U
E1668	13029-08-8	PCB-4	pg/L	N			39.6	U			41.6	U
E1668	52663-59-9	PCB-41	pg/L	N			79.2	U			83.2	U
E1668	36559-22-5	PCB-42	pg/L	N			79.2	U			83.2	U
E1668	70362-46-8	PCB-43	pg/L	N			79.2	U			83.2	U
E1668	PCB44+47+65	PCB-44/47/65	pg/L	N			238	U			249	U
E1668	70362-45-7	PCB-45	pg/L	N			79.2	U			83.2	U
E1668	41464-47-5	PCB-46	pg/L	N			79.2	U			83.2	U
E1668	70362-47-9	PCB-48	pg/L	N			79.2	U			83.2	U
E1668	16605-91-7	PCB-5	pg/L	N			39.6	U			41.6	U
E1668	PCB50+53	PCB-50/53	pg/L	N			297	U			312	U
E1668	68194-04-7	PCB-51	pg/L	N			79.2	U			83.2	U
E1668	15968-05-5	PCB-54	pg/L	N			79.2	U			83.2	U
E1668	74338-24-2	PCB-55	pg/L	N			79.2	U			83.2	U
E1668	41464-43-1	PCB-56	pg/L	N			79.2	U			83.2	U
E1668	70424-67-8	PCB-57	pg/L	N			79.2	U			83.2	U
E1668	41464-49-7	PCB-58	pg/L	N			79.2	U			83.2	U
E1668	PCB59+62+75	PCB-59/62/75	pg/L	N			238	U			249	U
E1668	25569-80-6	PCB-6	pg/L	N			39.6	U			41.6	U
E1668	PCB61707476	PCB-61/70/74/76	pg/L	N			317	U			333	U
E1668	74472-34-7	PCB-63	pg/L	N			79.2	U			83.2	U
E1668	32598-10-0	PCB-66	pg/L	N			15.4	J			83.2	U
E1668	73575-53-8	PCB-67	pg/L	N			79.2	U			83.2	U
E1668	73575-52-7	PCB-68	pg/L	N			79.2	U			83.2	U
E1668	PCB69+49	PCB-69/49	pg/L	N			158	U			166	U
E1668	33284-50-3	PCB-7	pg/L	N			39.6	U			41.6	U
E1668	74338-23-1	PCB-73	pg/L	N			79.2	U			83.2	U
E1668	32598-13-3	PCB-77	pg/L	N			79.2	U			83.2	U
E1668	70362-49-1	PCB-78	pg/L	N			79.2	U			83.2	U
E1668	41464-48-6	PCB-79	pg/L	N			79.2	U			83.2	U
E1668	34883-43-7	PCB-8	pg/L	N			39.6	U			41.6	U
E1668	33284-52-5	PCB-80	pg/L	N			79.2	U			83.2	U
E1668	70362-50-4	PCB-81	pg/L	N			79.2	U			83.2	U
E1668	52663-62-4	PCB-82	pg/L	N			79.2	U			83.2	U
E1668	60145-20-2	PCB-83	pg/L	N			79.2	U			83.2	U
E1668	52663-60-2	PCB-84	pg/L	N			79.2	U			83.2	U
E1668	55215-17-3	PCB-88	pg/L	N			79.2	U			83.2	U
E1668	73575-57-2	PCB-89	pg/L	N			79.2	U			83.2	U
E1668	34883-39-1	PCB-9	pg/L	N			39.6	U			41.6	U
E1668	52663-61-3	PCB-92	pg/L	N			79.2	U			83.2	U

00 SYR Water
Onondaga Lake (Syracuse NY)

Location ID					FIELD QC		FIELD QC		FIELD QC		FIELD QC	
Field Sample ID					OL-3073-FB		OL-3073-FB		OL-3142-FB1		OL-3142-FB1	
Depth (ft)												
Date Sampled					11/02/2018		11/02/2018		11/08/2018		11/08/2018	
SDG					8K00097		ONO71		8K00376		ONO72	
Matrix					WATER		WATER		WATER		WATER	
Purpose					FB		FB		FB		FB	
Type					BLKWATER		BLKWATER		BLKWATER		BLKWATER	
Method	Parameter Code	Parameter Name	Units	Filtered								
E1668	73575-55-0	PCB-94	pg/L	N			79.2	U			83.2	U
E1668	38379-99-6	PCB-95	pg/L	N			79.2	U			83.2	U
E1668	73575-54-9	PCB-96	pg/L	N			79.2	U			83.2	U
E1668	PCB110+115	PCB110+115	pg/L	N			158	U			166	U
E1668	PCB18+30	PCB18+30	pg/L	N			11.8	J			83.2	U
E1668	PCB183+185	PCB183+185	pg/L	N			158	U			166	U
E1668	PCB197+200	PCB197+200	pg/L	N			238	U			249	U
E1668	PCB40+71	PCB40+71	pg/L	N			158	U			166	U
E1668	PCB85116117	PCB85+116+117	pg/L	N			238	U			249	U
E1668	PCB93+100	PCB93+100	pg/L	N			158	U			166	U
E1668	PCB98+102	PCB98+102	pg/L	N			198	U			208	U